

PUBLISHED EVERY FRIDAY

AT

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: VICTORIA 8836 (6 lines)Annual subscription payable in advance and postage free:
British Isles and Abroad..... £2 5s. 0d.
Single Copies..... One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 61 No. 8

FRIDAY, AUGUST 24, 1934

CONTENTS

	PAGE
Editorials	291
Letters to the Editor	296
Publications Received	296
The Scrap Heap	298
Overseas Railway Affairs	299
New Passenger Coaches for the Swiss Federal Railways	301
Railway Cruising in Australia	306
New 4-8-2 Tank Locomotive for South African Service	307
Three-cylinder 4-6-0 type express locomotives, L.M.S.R.	308
Railway News Section	309
Personal	309
The Month's Railway Law	311
Ministry of Transport Accident Report—Doncaster, L.N.E.R.	312
Notes and News	315
Contracts and Tenders	316
Railway Share Market	318

ELECTRIC RAILWAY TRACTION

A Supplement illustrating and describing developments in Electric Railway Traction is presented with each copy of this week's issue.

Reviving Locomotive History

ALTHOUGH Stephenson's *Rocket* is preserved in the Science Museum, South Kensington, there are material differences between the engine in its present form and that in which it appeared at the Rainhill Trials. A formidable quantity of evidence as to the design and construction of the original locomotive was investigated by Robert Stephenson & Co. Ltd. in 1929, when the firm built a full-size working model of the *Rocket* to the order of Mr. Henry Ford. It may be remembered that the model was guardedly described as no more than "a fairly accurate representation of the *Rocket* as she appeared at first," but the authorities of the Science Museum have now shown their faith in the accuracy of the research carried out by the makers by ordering a somewhat similar locomotive for themselves. Like its predecessor, the South Kensington *Rocket* will be constructed of similar materials to those originally used, but as the boilers and cylinders are to be part-sectioned, it will not have its own motive power. To go a step further towards recreating the past, the museum authorities might care to follow the lead of the L.N.E.R. at the Railway Centenary celebrations in 1925, when the original *Locomotion* was propelled by a concealed petrol engine in the tender, while its chimney belched smoke from a fire fed with oily waste.

Replicas

In announcing the order by the Science Museum authorities for the model of the *Rocket* to which reference is made in the preceding note, a contemporary referred to the engine as a "replica" of Stephenson's locomotive. Were this not an age in which English words of the oldest standing tend to become distorted from their true sense, one might have been forgiven for doubting the truth of the remark, since a replica is properly a copy of a work of art executed by the same hand as fashioned the original. If George Stephenson is indeed in a position to build locomotives to-day, the L.N.E.R. may with justice add the promotion of longevity to the other claims made for a sojourn on the drier side of Britain. As a matter of fact, the disappearance of the lone craftsman of the Middle Ages made the true replica a rarity. To-day, it is obviously incorrect to apply the term even to two locomotives of the same class. But because it is a useful alternative to other words, it has outlived its sense, and even the Oxford Dictionary now records its use to indicate a copy or reproduction of any kind. It is to be hoped that though mass production has deprived it of one significance, its secondary implications of skill and art will survive.

* * *

The Week's Traffics

A year ago we commented upon the satisfactory increases shown in the receipts of the group railways as compared with the figures for the thirty-third week of 1932. The latest returns indicate some noteworthy advances upon those recorded last year, particularly in goods and coal traffic. The combined merchandise takings of the four groups at this period of 1933, for example, were £27,000 in advance of those for 1932, and the past week has seen a total increase under this head of £49,000. The coal results are still more remarkable. All companies except the Great Western showed slight recessions last year for this traffic, the combined position being £17,000 behind 1932. This year only the Southern Railway records a set-back—of £1,000—and a total increase of £34,000 is shown. In passenger traffic, the L.M.S.R. has exactly repeated its 1933 increase of £23,000. All the other railways have done still better in this direction than last year, although to a lesser extent. Aggregate receipts total an increase of £4,085,000, against a decline of £2,407,000 last year. By an error in our table last week, the amounts under the heading of "goods, &c.," included receipts from coal traffic. The correct figures of goods traffic are obtainable by subtracting column 3 from column 2.

	33rd Week					Inc. or dec.	
	Pass. &c.	Goods, &c.	Coal, &c.	Total.	Year to date	%	
L.M.S.R. ..	+ 23,000	+ 23,000	+ 10,000	+ 56,000	+ 1,722,000	+ 4.78	
L.N.E.R. ..	+ 21,000	+ 13,000	+ 23,000	+ 57,000	+ 1,650,000	+ 6.35	
G.W.R. ..	+ 4,000	+ 11,000	+ 2,000	+ 17,000	+ 431,000	+ 2.82	
S.R.	+ 10,000	+ 2,000	- 1,000	+ 11,000	+ 282,000	+ 2.26	

* * *

Stout Consolation

We await with interest the British Association's discussion on "the future of Britain's railways," at its coming conference in Aberdeen; meanwhile we should not expect to find comforting words in a report of the general meeting of a commercial firm, but in Lord Iveagh's speech to the shareholders of Arthur Guinness, Son & Company, of Dublin, there is a reference to railways which shows that they still have their use. Guinness & Son proposes to establish a branch in England and has selected Park Royal, near London, as the site because "from its situation on the Great Western Railway, . . . it affords every facility for transport." We must in fairness add that apparently the

fact of Park Royal being on the Grand Union Canal, and on important roads, also influenced the directorate, but we prefer to ignore those two weights in the balance. We understand that Guinness & Son manufactures a beverage known as "Guinness," and we have it on Lord Iveagh's authority that "Guinness is good for you"; it is therefore gratifying to find that the proximity of a railway affected the company's decision in settling down to make something that is good for the community, and when next we see someone having a "Guinness" we shall say to him, (conveniently forgetting the Grand Union Canal and the important roads), "Sir, for the conveyance of this drink you have to thank the railways."

* * * *

Overseas Railway Traffics

A further slight improvement in the rate of exchange—17.29 pesos to the £, as against 17.39 for the fifth week of the current financial year—has contributed to the strengthened position of the Buenos Ayres & Pacific and Central Argentine companies. The Buenos Ayres & Pacific is now only £234 behind its figures for the corresponding week of last year, instead of £18,155 as was the case a fortnight ago, while the Central Argentine records its first increase for 1934-5. Receipts in pesos for the four British-owned Argentine railways show increases in all cases, both on the week and the year. The tendency shown by the increase of £1,412,200 in Canadian Pacific aggregate earnings up to the end of July is well maintained by one of £1,493,200 for the week ending August 14. Bombay, Baroda and Central India aggregate traffic are well in advance of last year, though there is a slight recession in the weekly figures.

Railway.	No. of Weekly Week. Traffics.	Increase or Decrease.	Aggregate Traffic.	Increase or Decrease.
Buenos Ayres & Pacific ..	7th 68,884	- 234	492,615	- 99,572
Buenos Ayres Great Southern ..	7th 118,739	- 26,694	871,162	- 262,976
Buenos Ayres Western ..	7th 46,270	- 2,492	314,515	- 71,616
Central Argentine ..	7th 128,473	+ 7,947	916,754	- 101,663
Canadian Pacific ..	32nd 453,000	+ 21,600	14,515,600	+ 1,493,200
Bombay, Baroda & Central India	19th 117,150	+ 7,050	2,973,000	+ 141,000

* * * *

A Tyneside Golden Jubilee

Tuesday last, August 21, was the fiftieth anniversary of an event of which the influence upon Tyneside shipping and industry has never ceased to be felt, for it was on that date in 1884 that the Albert Edward Dock, Newcastle, was opened by His Late Majesty, King Edward VII, then Prince of Wales. Although not a railway enterprise, the demand for the dock arose out of an increase of trade at the port which had certainly been stimulated by the Tyneside activities of the North Eastern Railway. This company had early contributed to the revival of activity on the Tyne inaugurated in 1857 by the opening of the North-umberland Dock by the Tyne Improvement Commission. Two years later the N.E.R. had completed its own shipping facilities at Tyne Dock on the opposite bank of the river, and it was the increase of traffic due to these two factors that called into being the Albert Edward Dock, which obtained Parliamentary sanction in 1872. As a point of loading with deep water accommodation, the dock has enjoyed the full benefit of the expansion of the shipping trade of Newcastle and has more than justified the foresight of its promoters. To-day, as the British port of the B. & N. line to Norway, it receives regular through L.N.E.R. services from Kings Cross, inaugurated following improvements carried out by the railway to allow working East Coast stock to and from the quayside, and so maintains a close connection with the modern development of the company whose early enterprise was partly responsible for its creation.

Transport Centres of To-morrow

Railway development made the names of many small villages familiar throughout the country as the sites of junctions. The growth of air lines is now performing a similar office for a number of places which do not possess even a station. Heston, for example, half hidden in a labyrinth of byways between two busy arterial roads from London to the West, is probably known for its adjacent aerodrome from Putney to the Pyramids, yet it passes unmentioned in the index to "Bradshaw." Although its name was once linked with that of the District Railway station at Hounslow, even this distinction no longer remains to it. A similar example is Haldon aerodrome in Devon, a calling place on the routes of Railway Air Services from Plymouth to Bristol and Liverpool. Haldon hills, lying between the estuaries of the rivers Exe and Teign, are remarkable chiefly for having once formed the basis of a local expression. To be "as poor as Haldon" was the fate foretold for the youth of the country when it displayed contempt for the principles of thrift. To-day, Haldon is the airport for the nearby resort of Teignmouth, and the fact that the old saying appears to be no longer current may be taken as indicating the potential development derived from association with the youngest enterprise of the railway companies.

* * * *

Prince Henry Railway in 1933

Despite the increased activity in the Luxemburg mining and metallurgical industries during the second half of 1933, the receipts of the Prince Henry Railway for that year decreased slightly compared with 1932. Revenue amounted to 53,508,972 fr., a decrease of only 0.3 per cent., but the expenses were diminished by 3,340,545 fr., giving a working surplus of 10,469,914 fr. and an operating ratio of 80.5. After capital charges had been met there was a surplus of 2,842 fr. The goods tonnage rose from 6,842,097 in 1932 to 6,942,306, but despite the introduction of more trains and higher speeds, the number of passengers carried fell from 4,369,471 to 4,290,701. The working of the *vicinaux*, or local system, showed a deficit of 274,032 fr., or more than twice that of 1932, and in view of the continued loss on these lines the Prince Henry Railway, by virtue of its contract with the Luxemburg Government, gave up the working as from April 19, 1934. The State now owns and works all the narrow-gauge railways in Luxemburg with the exception of the Grundhof-Beaufort line, which is an integral part of the Prince Henry system.

* * * *

Transit Traffic in the "Corridor"

After prolonged negotiations, new agreements were concluded on February 14, 1933, between Germany, Poland, and Danzig concerning the transit traffic across the Polish Corridor. These agreements, which modify that made on April 21, 1921, were ratified on June 27 of this year and are intended to afford better transit facilities between East Prussia and the rest of Germany, allowing the traffic to be conducted with fewer formalities on all sides. The original agreement was, of course, the outcome of the Versailles Treaty, chiefly Articles 89 and 93, and laid down, among other things, the conditions under which the so-called privileged trains were to be run across the Corridor over certain routes only. No fewer than twenty-one railway lines connecting the present German territories with Poland have been closed at or near the new frontiers. Under the new agreements, modifications are introduced in the number of axles allowed in the various classes of through trains and in the regulations dealing with break-

downs, conditional timings and routings, the treatment of persons injured in accidents, and their property. Telephone, telegraph and postal traffic is also affected for the better. Passengers will welcome the abolition of the regulation under which the windows of a privileged train could be opened only while it was in motion, and then only on the corridor side of the carriages, an intolerable requirement in hot weather. Military traffic, which was severely restricted under the 1921 agreement, now enjoys new facilities, Germany being able to send many more trains than before. A control office is to be set up in Danzig to regulate the working and keep in touch with the stations concerned. The transport of persons under arrest has also been simplified.

* * * *

The Doncaster Collision

We have often spoken of the greater difficulty that attends the condensing of the Ministry of Transport reports on derailments than that experienced when dealing with those on collisions. But the report, reviewed on a later page, by Lt.-Col. Woodhouse on the collision, in a dense fog, at Doncaster at 1.52 a.m. on March 28 between the two portions of a night express from King's Cross, contains so many incidents of note that we have found it difficult to summarise it. We would, for instance, have been sorry to have had to omit the record as to the action taken by the signalmen concerned and by the driver of the first portion, when he saw a signal-box but could discern no signals, in sending his mate to the box for instructions. Although, as Colonel Woodhouse remarks, it was probable that the collision would not have occurred but for that, the driver's action cannot be criticised in any way—any prudent man would have done the same in the circumstances. If certain factors told against the safe passage of these two trains there was one in its favour. That was that, when the second portion ran into the first a relatively fragile wooden-framed refrigerator van was at the end and took the brunt of the collision. The three main adverse factors were: (1) that though the fogmen were sent for by 12.45 the first did not arrive until 1.45 and the last at 3.5; (2) the driver of the second portion had, as our summary shows, an exceedingly limited knowledge of the road at night; (3) his fireman had been working with him for about a month; he was not well acquainted with the road and said that if he had seen a signal he would have had to leave the interpretation to the driver. The probable misunderstanding by the driver of what the fireman said, related in our summary, no doubt added to these adverse factors.

* * * *

The Obvious Remedies

It may be assumed the Doncaster collision would not have occurred had the fogmen been on duty. Thus, once again, the perils of a sudden fog are brought home to us. It is, though, only fair that it should be said that the delay in fogmen arriving for duty in a sudden fog has not been a contributory cause in an accident that has been reported upon since that at Ashchurch on January 8, 1929. There, the last man got to his post in 1 hr. 52 min. after the caller left the station. But at Doncaster the interval was 2 hr. 20 min. and one of the signalmen said that it was not unusual for fogmen to take two hours to report after they had been summoned. We do not recite these facts in order to suggest that the methods for sending for fogmen should be improved but in order to repeat the opinion of Colonel Woodhouse that automatic train control would have averted the collision. We quite agree, but will not stop to argue whether or not a cab-signal would have been sufficient; it certainly would have told the

driver that the one green light he saw in the advanced starting signal at Black Carr had a yellow distant light under it and would have helped him, too, in his right-hand driving. As we say, we shall not comment on that recommendation but proceed to emphasise the observation that follows in the report, to the effect that colour light signals would, in all probability, have been visible, at short range, under such conditions. Meanwhile, there is the fact that, in the absence of fogmen, the provision of detonator-placer machines might have averted the danger. The driver of the second portion said that he might have been able to avoid the accident if he had exploded a detonator at any of the signals concerned.

* * * *

Enamelled Signal Arms

After passing through various stages of development, the enamelled signal arm is being consistently used in almost all new work by many railway managements at home and abroad, dispensing with the troublesome process of painting, formerly undertaken at intervals to preserve the visibility of the signals. In some localities, moreover, the effects of painting did not last long and the arms were soon covered with soot and grime once more. The enamelled arms are certainly an improvement, but it may be doubted whether we are obtaining all the benefit we might from their use. They are frequently allowed to become extremely dirty, the yellow distant signal arms assuming a khaki colour which makes them almost invisible, and they seem to be cleaned no more often than the old arms were painted. We are not very consistent in these matters. We would not allow the lenses of colour light signals to become so coated with dirt that the light from them was hardly visible, yet we show little anxiety to make the semaphore arms, which are equally important for the drivers, always clearly discernible. It ought surely to be possible to institute some better methods of cleaning them than appear to prevail generally at present, and so give the driver the benefit of bright signal arms at all times.

* * * *

The All-Welded Locomotive

An article appearing in the July number of *The Welder* emphasises the approach of the all-welded locomotive. Reference is made to electric welding as applied to locomotive construction at the Crewe works of the L.M.S.R., where fabrication by welding takes the place of iron or steel castings and also to some extent of riveted structures. The author, Mr. William Hart, states that the number of parts so fabricated is constantly being added to as improved methods of welding become available. Sand-boxes, steam pipes, running board supports and foundation rings are examples of parts now being wholly built up by this method, while boiler seams and pads for boiler mountings are electrically welded in addition to riveting. Arc welding now also plays an important part in the manufacture of new boilers. All the sections of the boiler are riveted, but the lap jointed seams are welded in addition. This strengthens the joints and prevents leakage of steam. When the boiler comes into the workshop for repairs, the seams require very little attention. Steam pipes are fabricated from three separate plates. The pipe and two flanges are made of mild steel plate and the pipe is cut to the required shape before rolling. The pipe is welded after rolling and the two flanges set into position and welded to it. An article on page 878 of *THE RAILWAY GAZETTE* of May 18 referred to the cylinders of a 2-6-4 tank engine built at the Derby works of the L.M.S.R. which were completely fabricated from steel plates, welding forming an essential part of the process.

Railways and Holidaymakers

THE holiday season is now at its peak and the great London termini and provincial stations are experiencing once again the animated scenes so dear to the heart of the departing holidaymaker—and the press photographer. To witness the activity of an important station during recent weeks has been sufficient indication that the era of the railway as the premier passenger carrying organisation is by no means over. On the contrary, there are welcome signs that rail travel is gaining in popular favour. Many who have given a trial to long distance journeys by road are returning to the railway as a quicker, safer and more comfortable means of conveyance. The railway companies themselves have played no small part in this change of attitude on the part of the travelling public, and they deserve every credit for the initiative and enterprise which they have displayed in recent years. The introduction in May, 1933, of "summer" tickets at pre-war return fares, available by any train and enabling holders to return either on the day of issue or any subsequent day within a month, was a courageous step, equalled only by the subsequent decision to continue the facility throughout 1934. There can be no doubt that this piece of wise diplomacy has been largely responsible for the increased popularity which rail travel now enjoys. In addition to enabling holidaymakers to reach their destinations with a minimum of expense, the railway companies have considerably extended the cheap ticket facilities available in the various holiday districts. Amongst the most popular of these facilities are the seven-day holiday season tickets, costing about 10s. third class and 15s. first class. These tickets afford unlimited travel over certain areas during a period of seven days and constitute a cheap, easy and comfortable means of seeing all that is beautiful and interesting in the neighbourhood of the issuing station.

The association of the railways with road transport and steamship companies has enabled them to extend the scope of their facilities and to arrange combined rail, road and steamer trips covering districts of romantic, historic and scenic interest to the tourist. Numerous tours have been introduced and the companies are prepared to quote for special journeys to meet individual requirements. Arrangements are also made for parties requiring inclusive rail, hotel accommodation, and local road motor tours. Not content with catering for the ordinary holidaymaker who takes a single resort as the centre of his holiday excursions, the companies have sought to meet the requirements of those who want a holiday "that is different." For some years the G.W.R. has arranged personally conducted "land cruises" by rail and road at fares which include hotel accommodation, table d'hôte meals, gratuities at hotels and admission fees to places of interest visited *en route*. The London & North Eastern Railway's cruising train, the Northern Belle, takes passengers over 2,000 miles of the most beautiful parts of England and Scotland, and for a moderate inclusive fee passengers live on the train in first class comfort for a whole week, travelling by night and sightseeing by day. For those who prefer a holiday afloat, an extensive programme of pleasure cruises by comfortable railway steamers has been arranged to the nearer Continental centres, in addition to which there are cruises on the Clyde and other Scottish waters ranging from half-a-day to five days. Camping coaches have been introduced for the devotees of the less sophisticated form of holiday. For sums as small as from £2 10s. to £3 a week, a railway carriage, fitted to accommodate six persons and complete with every household requisite, can be hired. For those who spend their holidays at home, there are cheap day return tickets

at approximately 3d. a mile to local stations, in addition to which a large number of day and half-day excursions are run from London and the principal provincial centres, the fares in the case of the half-day trips averaging about three miles a penny. There are also evening excursions by means of which town and city folk may travel to the nearest seaside resort by special trains and at fares as cheap as five miles a penny. Keeping pace with the growing popularity of rambling and camping, the companies cater extensively for all interested in these healthful pursuits. Ample facilities are extended to large parties travelling together for a day's outing, and expert staffs are available to advise and assist the promoters of such expeditions.

While it will be appreciated from the foregoing that there has been no lack of enterprise on the part of the railway companies and that the increased popularity of rail travel must be attributed in no small measure to the progressive policy which is being followed, it must not be assumed that there is not still room for greater effort. So successful have the railways been in attracting a greater patronage that at times of holiday peak traffic, such as the August Bank Holiday week-end, some discomfort has been suffered due to the overcrowding and lateness of trains, as well as to the platform staffs being too hard pressed to give adequate attention to passengers' queries. This sort of thing is indeed difficult to avoid, but it does bring down a certain amount of wrath upon the railway managements.

* * * *

Evolution of the Sleeping Car

NEARLY a century ago the railroads of the U.S.A. were rapidly extending their tracks westward from the Atlantic seaboard mainly as links in chains of combined rail and inland water transport of considerable length. Through journeys naturally occupied several days, with the result that night travel was essayed, the arrangements being usually for passengers to sleep on a boat. Some night trains, however, were introduced, and thus arose the need for sleeping accommodation on the rail. It would appear that the primitive sleeping car developed from the bunking car which was used to some extent by house construction gangs in sparsely populated country, and, although the evidence is by no means conclusive, the first provision of a sleeping car for passengers was probably made by the Cumberland Valley Railroad (now part of the Pennsylvania system) when its line from Harrisburg to Chambersburg was opened in November, 1837. This car is stated to have been a second hand day coach adapted to sleeping purposes by being divided into four compartments with three bunks in each, built against one side of the car; a roller towel, basin and water were provided at one end of the coach. Various other rude attempts followed, some providing narrow mattresses or blankets on shelves or bunks built in tiers on each side of a car. Users, of course, did not undress, but simply lay in the bunk with the then fashionable carpet bag for a pillow, after having obeyed the injunction "Passengers will please remove their boots before getting into the berths." Such cars never became popular, and therefore were used only to a limited extent; their crude accommodation cannot have been very comfortable and little, if any, better than that provided by lounging in a day coach, which was the general custom with night travellers for two decades.

One sultry spring night a young cabinet maker named George Mortimer Pullman suffered so much from his attempts to sleep in a badly riding day coach that he measured the vehicle carefully and proceeded to evolve

satisfactory sleeping arrangements. In 1858 he obtained the consent of the Chicago & Alton Railroad to convert two of that company's 44-ft. coaches so that facing seats could be made into one bunk while hinged upper berths let down at night and made cupboards for the blankets by day; the reconstruction cost less than \$1,000 (£200) a car. These were introduced between Bloomington and Chicago in the summer of 1859, exactly three quarters of a century ago, and immediately proved popular. Pullman followed up his success by designing an entirely new car, called the *Pioneer*, which he built in a Chicago & Alton shed in 1863 at a cost of approximately \$18,000, or about four times as much as had previously been spent on any American railway carriage. Its solidity and comfort, however, made night travel less irksome and thus began the era of the modern sleeping car. The Pullman Palace Car Company was formed in 1867 and its activities have since spread throughout the United States. Various rivals came into being, by far the most important of which was the Wagner Palace Car Company, which was backed by Commodore Vanderbilt and so had a privileged position on the New York Central lines. After some thirty years of competition the Pullman interests absorbed the Wagner business in 1899.

One of Pullman's earliest competitors was Col. William D'Alton Mann, who designed a "boudoir car" in which the beds were placed transversely instead of longitudinally. The arrangement never found favour in the United States, but became popular in Europe. The pioneer of sleeping cars on the European continent was the Belgian engineer, Georges Nagelmackers, of Liège, whose activities, begun in 1872, developed in 1876 into the present International Sleeping Car Company. Nagelmackers and Col. Mann joined forces and in May, 1873, a train of sleeping cars was introduced between Paris and Vienna, via Strasburg. The Wagon-Lits Company was also responsible for inaugurating the first long-distance international *de luxe* train when the Orient Express, composed entirely of sleeping, dining, and drawing room cars, was established on June 5, 1883. Up to 1914 this company was the sole concessionaire in Europe for international services, and, with the exception of Prussia, ran national services in various countries. In Prussia a company was founded at the beginning of 1887 for running sleeping and dining cars entirely within that country. From 1914 onwards the Wagons-Lits Company was precluded from working in Central Europe and during the war the Mitropa Company was formed and took over, on January 1, 1917, the sleeping car and restaurant services in Germany.

The year 1873 saw the introduction of sleeping cars in Great Britain when the Ashbury Railway Carriage & Iron Co. Ltd., of Openshaw, Manchester, produced a vehicle in which three beds in each compartment were provided by pulling down the apparent back of each seat. Such cars were placed in service on the East Coast Route between King's Cross and Glasgow on September 1, 1873. The L.N.W.R. introduced a sleeping car of its own design on the Euston-Glasgow service on October 1, 1873. In the same year Sir James Allport, of the Midland Railway, visited the U.S.A. and made a contract with the Pullman Palace Car Company whereby some 51½ ft. cars were made at Detroit and assembled at Derby. The sleeping car service was inaugurated between St. Pancras and Bradford on June 1, 1874, and between St. Pancras and Liverpool on April 1, 1875. These ran as Pullmans until 1888 when the Midland Railway bought them. The G.W.R. introduced sleeping accommodation in December, 1877, on London-Penzance night expresses. At the present time all sleeping car services in Great Britain are provided by the respective railway companies.

Earthquake Effects on an Indian Railway

THE full effects of the recent earthquake in Bihar, India, and in particular on the lines worked by the Bengal & North Western Railway, can now be stated with reasonable accuracy. On these lines, aggregating 2,105 route miles and laid to metre gauge, 440 bridges were wholly or partially wrecked and 550 miles of line were temporarily put out of action. It may be explained that the great Gangetic plain, in which this system is spread out like a net, is in reality a crust over what may be several thousand feet of wet silt, subsoil water being almost everywhere from 5 to 50 ft. below the surface. Consequently, when the earthquake shook the whole plain like a jelly, the crust broke up and fissured, the water below it exuding violently from the cracks. Wherever there was a heavy embankment, it subsided into the ground, carrying with it the abutments of bridges, while the lighter bridge piers remained comparatively stationary or were, in some cases, even squeezed upwards, their tops being from 2 to 7 ft. above those of the abutments.

Repairs have now been carried out so that, with the exception of about 30 or 40 miles of line and some of the larger works, which will be tackled after the monsoon, everything is comparatively normal again. But such a transformation is the result of most strenuous efforts by the staff throughout the hottest months in the year with shade temperatures in the neighbourhood of 110° day after day. Scorching sand and dustladen winds from dawn to dusk have added to the discomfort of the Europeans, who have had to live in grass huts or carriages, the water in the roof-tanks of which is daily too hot to use for bathing, and all metal exposed to the sun is too hot to touch. Such is the not infrequent lot of the railway engineer in India, either when damage caused by such catastrophes has to be repaired or when anything goes wrong, or even in the normal course of routine work, especially if it be survey or construction.

* * * *

Locomotive Axle Experiments

EXPERIMENTS are being made by one of the leading railways in America in developing stronger and better axles for locomotives than can be produced from solid forgings. A number of engines have been equipped with axles of composite construction made by inserting an 8-in. diam. shaft or core of high tensile chrome nickel steel into a 13 in. diam. outer shell of a steel suitable for withstanding the friction and heat of journal bearings. It is claimed that axles of this construction can be made 32 per cent. stronger than a solid nickel steel axle of the same dimensions. Wear limits can be increased, because progressive fractures, which in nearly all axles originate on the surface, involve only the outer shell. The inner core provides sufficient strength to hold a fractured axle together until detected by inspection, and complete axle failures are thus eliminated. The outer shell, when damaged or worn to limit, can be readily replaced and the inner core continued in service. The relatively thin sections of core and shell ensure maximum freedom from internal stresses set up during forging and quenching. The first axle of this type was applied in October, 1931, to the main driving wheels of a 4-8-4 type locomotive from which three axles had been removed after short periods of service averaging 58,768 miles an axle. The original composite axle is still in use and in good condition after running 144,725 miles, and six other engines of the same type have been similarly equipped. In four of these engines the composite axles have run over 100,000 miles each without replacement.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

São Paulo Railway Speeds and Progress

Brighton, August 16

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In your issue of August 10 there appears under the heading of "São Paulo Railway Progress" the statement that "Beyer-Garratt locomotives work the principal expresses between São Paulo and Jundiahy, the intervening 40 miles being booked to be covered in 60 minutes, in spite of the fact that the maximum speed permitted is 43 m.p.h., that loads average 500 tons, and that ruling grades are as steep as 1 in 40 and sharp curves have to be negotiated." Now the sharpest curve on this line has a radius of 791 ft., and the grade of 1 in 40, following several miles of continuous climbing, is over a mile long. On the 791 ft. curve a speed limit considerably lower than the allowed maximum of 43 m.p.h. must be observed, while nearly 4,000 drawbar h.p. are required to maintain a speed of 43 m.p.h. with 500 tons on the 1 in 40 grade. In the circumstances it seems hard to believe that the booked time would be kept without exceeding the speed limit of 43 m.p.h. on the down grades. Even when allowance is made for the fact that the distance is $37\frac{1}{2}$ miles, and not 40 as stated, the performance seems too good to be true. The Beyer-Garratt locomotives in use on this railway are capable of a much higher speed than 43 m.p.h. and the evidence is that speeds of 55 m.p.h. and over are commonly reached on lines in South America where a limit in the neighbourhood of 43 m.p.h. is supposed to be in force. The permanent way of the São Paulo Railway appears quite good enough to permit fast running over considerable stretches, and therefore the speed restriction of

43 m.p.h. would appear to be only another of those which, though not consistently observed, tend to hamper railway development.

S. MIAL

British Subjects in Overseas Appointments

c/o The Chartered Bank of India,
Australia and China,
38, Bishopsgate, E.C.2.

August 20

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I was very greatly interested to read in your issue of August 3 a letter concerning the security of employment of British railwaymen who take up service on overseas railways. This warning of lack of security is very necessary and also applies to British-owned concerns. There must be many who have regretted leaving a home railway to take up what they were given to understand by the railway seeking their services would be permanent and secure employment, only to find themselves "economised" on reaching middle age, with no prospect of further employment. Even the highest position on the smaller railways is not secure from summary "retrenchment"—as my own case shows, after nearly 20 years' service—and which I trust will be a warning to others to consider very carefully before taking up service on overseas railways.

I enclose my card and remain,

Yours faithfully,

AN "AXED" CHIEF EXECUTIVE

(now two years unemployed)

PUBLICATIONS RECEIVED

Cheltenham Flyer: A New Railway Book for Boys of all Ages.

By W. G. Chapman. London: The Great Western Railway (James Milne, General Manager), Paddington Station. 5 in. \times 7 $\frac{1}{4}$ in. \times $\frac{3}{4}$ in. 235 pages; 113 half-tone and 16 line illustrations, also a colour plate. Paper covers. Price 1s. —Comparisons are odious, but it is hardly open to dispute that in "Cheltenham Flyer" the Great Western Railway has produced the best railway book ever yet published at such a price as one shilling. It is astonishing value for the money; and little indication is given in the title of the wide scope of its contents. To a certain extent the book incorporates the matter of "The 10.30 Limited" and "Caerphilly Castle," which appeared in 1923 and 1924, but all the developments of another decade now come under review, while the new book leaves its predecessors far behind in size and the remarkable excellence of its pictures. The reader is first introduced to the Cheltenham Flyer, then to the Cornish Riviera Express, and then to present-day Paddington; after this the internal economy of the locomotive is explained in simple language, and a journey from London to Swindon affords opportunity for describing the construction of the track, signalling, water-troughs, the working of the brakes, and a host of other details con-

cerning the equipment and operation of a railway. On arrival at Swindon he is taken for a comprehensive tour of the locomotive, carriage, and wagon works; and the culminating chapter pictures, in graphic language, the return to London by—of course—the Cheltenham Flyer. A special word of congratulation is due to the compilers on the collection of 113 photographs, some of them across double pages which open flat, and all handsomely reproduced on art paper. A large proportion of these photographs—which include many pictures of the Cheltenham Flyer and other Great Western expresses at speed—are original, and in consequence the book will be all the more sought after by the railway enthusiast. The colour-plate of the Flyer which serves as a frontispiece is not, however, on the same level of excellence. As a minor criticism we are sorry to see blazoned on the back cover "World's Fastest Train," and the same claim again as the heading to the first chapter, as well as at other points in the book, when for a whole year past this title has been held by the Flying Hamburger of the German State Railway. True, the author does tuck away at the bottom of page 2 the qualification "I ought to make it quite clear that by 'railways' I mean steam railways in all cases"; but on the score of relative prominence

"The World's Fastest Train" has it handsomely! Furthermore, a description is given in Chapter VIII of the book of the diesel railcars of the G.W.R., so that even the qualification is not entirely accurate. Nor is the statement that the latest G.W.R. streamlined express railcar covers "the 117 $\frac{1}{2}$ miles between the Midland and Welsh capitals at an average speed of 56 $\frac{1}{2}$ miles an hour, including stops," when the actual average of the four daily services is barely 50 m.p.h. But these errors are easily rectifiable. Perhaps the best feature of the book is the witness that it gives, implicitly and explicitly, to that esprit de corps which has helped to make the Great Western Railway what it is to-day.

Steam Car Developments and Steam Aviation. Whitby, Yorks: R. H. and H. W. Bolsover, 27, Castle Road. 9 in. \times 5 $\frac{1}{4}$ in. 20 pp. 9d. monthly.—In view of the present supremacy of the steam engine for ordinary main-line work on railways, it is not surprising that steam should be considered a suitable agent for propelling road motors and aeroplanes. A small but earnest band of enthusiasts is experimenting both on the road and in the air and this modest little magazine provides a record of their achievements and their hopes. We were interested to learn from the June number that an advantage of the steam engine in aeroplanes is its reversibility. As is well known, brakes on the wheels of an aeroplane are practically useless

because they give a retarding force so far below the centre of gravity of the machine as to produce a somersaulting tendency. A reversed propeller, however, can be used with impunity, and it is claimed for a successful steam aeroplane in America that it can be landed at 50 m.p.h. in a field only 100 ft. square.

The Illinois Central Railroad and its Colonization Work. By Paul Wallace Gates. Harvard Economic Studies 42. Harvard University Press. London: Humphrey Milford, Oxford University Press, Amen House, Warwick Square, E.C.4. 8½ in. × 6 in. 374 pp. Price 17s. net.—This economic study will be mainly of interest to American economic historians and more particularly to those of the Middle West as well as inhabitants of Illinois, but there are wider aspects of the story which Prof. Gates lucidly unfolds and certain facts which are of considerable value to British railwaymen throughout the world. In some ways the Illinois Central is more closely linked to London than any other American railway, and it is indeed one of the few to maintain an agency in the British capital. This book relates how British bankers in the 1850's alone made the construction of the line possible, and there are frequent references to the Rothschilds and the Barings. In 1864 no less than 75 per cent. of the outstanding stock of the Illinois Central was held by British investors, and until the end of the century the railroad was owned largely by English and continental financiers.

The history of the railroad may be said to start with a Federal land donation bill of 1850; thereafter the centre of political interest changes from Washington to Illinois and the book is virtually confined to a study of the land sales and colonisation methods of the railway in that state, its main stems stretching from Dunleith in the extreme north-west and Chicago in the north-east to Cairo in the extreme south at the confluence of the Ohio and Mississippi rivers. Cairo is in Egypt, like its namesake, the name Egypt in Illinois apparently having been derived from its unhealthy climate in the 1840's. Few will remember that Richard Cobden, William Gladstone, and Sir James Caird, the authority on agriculture and an M.P. at that time, were intimately connected with Illinois Central finance and the colonisation policy of the railroad. Fewer still will know that Cobden invested nearly all his savings in the line or, a point not mentioned by the author, that Charles Dickens's brother was employed by the company.

The immigration policy of the railway as a means of selling its 2,500,000 acres of land grant in Illinois was directly responsible for the election of Abraham Lincoln, at one time its attorney, to Congress, without which world history might have been very different, but the interest of this book to railwaymen will be mainly for other reasons. Described by Cobden as "primarily a land company and secondarily a railroad com-

pany," the story of its search for immigrants in Sweden, Germany, France, Ireland, Great Britain, Canada, and Poland, is a romantic one, and one is struck by the fact that during the Civil War, which hit the railroad very hard, maize sold as low as six cents a bushel, with the result that there was no profit for the farmer and it was burned as fuel.

In spite of a few important mistakes the administration and sale of the Illinois Central's grant was wisely and well carried out, and, though the railroads are stated to be much more public-minded to-day than they were even a generation ago, their efforts are not wholly disinterested but are designed to build up freight and passenger traffic. The Illinois Central with its Land Department was a pioneer, and in the 1860's offered a prize of \$3,000 for the invention of a successful steam plough. The author, who has included a detailed bibliography and a good index, states that until 1870 the Illinois Central was the most popular railroad in Illinois. "The one thing that stands out above all others in this matter is the extreme leniency shown by the company to purchasers of its lands." The Land Department was liquidated in 1905, but the book primarily covers the period 1840-1880. Although somewhat repetitive in parts, and with a few printer's errors, the story is engrossing and might well be followed with a complementary volume dealing with the work of the present Industrial Department of the Illinois Central which, like its predecessor, has pioneered in assisting the improvement of crops and livestock. The Illinois Central, connecting the real south with Chicago, is still a line with personality, and contact with it is always a pleasure because it has characteristics so essentially unique.

B.I. Wiring Systems.—British Insulated Cables Limited, of Prescott, Lancashire, sends an illustrated catalogue of wiring systems and accessories. In the paper twin-wiring system, which is particularly suitable for domestic use, the two conductors are wrapped with impregnated paper and carried together in a single lead sheathing. For use with B.I. rubber twin wiring, which is housed in an earthed metallic case, an extended range of fittings is now available. These include weather-proof joint boxes, switches and switch-plugs for outdoor service. New accessories, developed in collaboration with the Cable Research Committee, have also been introduced for the T.R.S. wiring, a feature of which is the tough rubber sheathing, combining adequate protection with a flexibility that makes for easy working. A new and more comprehensive range of joint boxes is now in production for use with the B.I. bond-wire system, in which a tinned copper bonding wire under the metal alloy sheath of the cable provides for easy connection of adjacent lengths. An addition to the B.I. range of wiring systems introduced with this catalogue

is one having all cables, distribution boards and other fittings enclosed in a solid ebonite casing, making it particularly suitable for situations where there is danger of corrosion attacking other types of insulator. In addition to the foregoing, a special wiring system for collieries, including a range of flame-proof and watertight junction boxes, is available.

Chemical Fires.—This little handbook is edited by Mr. A. Pordage, O.B.E., Secretary of the Institution of Fire Engineers, and is obtainable at the offices of that institution, 20, Melville Street, Edinburgh, at 3s. 6d., post free. It will be found especially helpful for fire brigade officers, ships' officers, transport managers, and others liable to be called upon to deal with emergencies arising from fires and accidents in which dangerous chemicals are involved. A list of symbols and atomic weights has been added, which should be of assistance to those who are not familiar with chemical formulæ.

The Ball Bearing Journal.—We have received from the Skefko Ball Bearing Co. Ltd., Luton, a copy of the firm's half-yearly publication dealing with developments in anti-friction engineering. The present issue, which begins the ninth yearly volume, contains articles on bearing design for oil-well pumps, super-speed lathes, mine hoists and other classes of machinery. A detailed description is given of a 8½-in. centre lathe for taking cuts absorbing up to 10 h.p. The use of roller bearings for the spindle has enabled work considerably heavier than that for which the machine was designed to be handled without a sign of "chatter" marks on the finished surface.

Aluminium Production, Properties and Applications.—The scope of this booklet, which is published by the British Aluminium Co. Ltd., Adelaide House, E.C.4, is too well summed up in the title to require further elaboration. It may be added, however, that the letterpress and illustrations combine to present the qualities and advantages of the metal very attractively. A special section deals with aluminium in the transport industries. Among the railway vehicles illustrated are the Great Western A.E.C. railcar No. 1, the body of which is panelled in aluminium sheet, and a duralumin double-decker coach for the Paris suburban services of the French State Railways. It is pointed out that the reduction in inertia due to the light weight of aluminium rolling stock is particularly advantageous where journeys with frequent stops are involved. That the metal can be used with equal advantage in the construction of coaches for main-line services is shown by reference to the special vehicle built for the L.N.E.R. in which all the main portions of the body are of aluminium castings, to the all-aluminium Pullman car exhibited at the Chicago World Fair in 1933, and to the Union Pacific high speed train.

THE SCRAP HEAP

"Porter, I've got something I want you to put on the 2.30 for me."

"Sorry, mum. I ain't allowed to take bets."—*To-day's story in the "North Mail."*

* * *

From the Island of Ruegen (Germany) comes a story which is vouched for by the guard of a luggage van which travels daily from Putbus to Bergen. He says that two swallows have built their nest in the van. They fly beside the train in the daytime and bring food to their young at each stopping-place.

* * *

The third item on our Scrap Heap page of the August 10 issue has prompted a correspondent to ask: "Are there any tigers in Africa?" The answer is in the negative. But we have only partly erred—if, indeed, at all—in passing the pun without a word of explanation; for, as most people know, "tiger" is commonly used in the sub-continent to denote a member of the leopard tribe, and the "Oxford English Dictionary" allows of such usage, as also of the comparable American use of "tiger" for members of the same genus, such as the jaguar and puma.

* * *

KEIGHLEY STATION CAT

Nigger is a remarkable cat, her adopted home being the porters' room at Keighley station. No one knows whence she came, but since her arrival she has thoroughly settled down, and woe betide any other cat—or dog—who dares put its foot into the porters' room. One of Nigger's most surprising feats is the way in which she brings in her own dinner. Midway through every morning she disappears, to return shortly afterwards proudly carrying in her mouth sufficient "lights" for her mid-day meal. No one knows where she gets them, but she places them on the floor and cries until they are picked up and placed in a pan on the fire to cook.

Then she settles down to sleep until dinner time. Since her appearance at the station the mortality rate among the rats in the neighbourhood has gone up tremendously, although some of the rats are almost as big as Nigger herself. —*From the "L.N.E.R. Magazine."*

* * *

In the 1,013 km. of railway in Switzerland there are 49 tunnels, forming a total length of 17,297 m., so that one sixth of the railways is underground. —*From the "Illustrated London News" of October 12, 1861.*

* * *

TRAIN MUSIC

The Portsmouth train stopped at a station between Guildford and Haslemere. An elderly man boarded it, dressed in blue shorts, red mess jacket, almost white waistcoat, red pillbox hat with chin-strap. He stood in the corridor of the most crowded coach. As the train started he bowed at the door of each compartment. Then he drew from his pocket a fife and marched, lurching slightly as the train swayed, up and down the corridor, playing military music. Shortly before the next station he bowed again at the door of each compartment, this time with pillbox hat outstretched for his reward. —*Peter Simple in "The Morning Post."*

* * *

STANDEGE TUNNELS, L.M.S.R.

The Standedge tunnels, on the old L.N.W.R. route from Manchester to Leeds, are the third longest railway tunnels in Great Britain, being over 3 miles in length. We are indebted to the *L.M.S. Magazine* for the illustration which we reproduce showing the Diggle end of these tunnels; the double-line one shown on the left was opened in 1894, the middle (single bore) in 1848, and the right hand (single bore) in 1870. At the time the last named was completed the Standedge tunnels were the longest in England (subsequently the completion of the Severn, G.W.R., 4 m. 624 yd., and the Totley,

Midland Railway, 3 m. 950 yd., reduced it to third rank), and the following notes were published in *The Railway News* of March 11, 1871:—

The L.N.W.R., from Liverpool and Manchester to Huddersfield and the North, passes through a range of hills separating Marsden on the Yorkshire side and Diggle on the Lancashire side, the range bearing the name of Standedge, and it has now three tunnels running through it—one a canal tunnel, and the other two for the purposes of the railway. The first-named was commenced in 1794 and completed in 1811; length 5,451 yd., or 3 m. and 171 yd.; cost £123,803; and the loss of life during its progress was serious. The first of the two railway tunnels was made by Mr. T. Nicholson, contractor for the Woodhead tunnel, which is shorter than the Standedge one by about forty yards, Standedge being 3 m. and 60 yd. long. It was commenced in 1845 and completed in November, 1848; the cost was £171,003 12s. 3d., of the approaches £30,605, making a total of £201,608, and the largest number of men employed on the undertaking was 1,953. Nine fatal accidents occurred in its construction. Thomas Nelson & Sons, of Carlisle, were contractors for the new tunnel; the work was commenced in the middle of April, 1868, and was completed in the middle of October, 1870, or six months earlier than the time specified. Its exact length is 5,435 yd., one yard less than its twin tunnel; but the actual length constructed by the Messrs. Nelson is 5,297½ yards, the difference arising from a short piece at each end having been made when the first railway tunnel was executed. The whole length is lined with red bricks, faced with blue Staffordshire bricks. The height of the tunnel inside the brickwork is 20 ft., and the width 15 ft. The total quantity of brickwork built is 52,156 cub. yd., the total number of bricks used being 16,831,149, the weight of which amounts to 68,000 tons; 6,271 tons of coal, 472 tons of coke, 2,421 tons of lime and 140 tons of cement were consumed; and of powder 1,744 casks, equal to 174,400 lb.; fuzes, 35,853 coils, each 25 ft., equal to 170 miles; candles, 8,745 dozen pounds, equal to 104,940 lb.; oil, 6,416 gallons; and vast quantities of timber were used. The rubbish was conveyed away by means of tramways, which ran through passages under the railway, and was tipped into boats on the canal before mentioned. It was conveyed through "break-ups" or cross-headings,

of which Messrs. Nelson constructed 21; but only 16 were used at one time. For the conveyance of the material used in the construction of the tunnels 25 boats and four steamboats were constantly plying, and an immense expense had to be incurred in erecting huts, providing business offices, and putting down costly plant for economising labour. Only one life has been lost during construction, but there have, of course, been plenty of accidents of a less serious nature. The work has been pronounced satisfactory in all respects, and the line is reported as being one of the smoothest portions of railway travelling in the kingdom. The line was opened about the middle of last month for regular traffic.



The Standedge tunnels, showing (left) the double-line bore of 1894; (centre) the single-line bore of 1848; and (right) the single-line bore of 1870. The canal tunnel is on a lower level to the right of the double bore

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

Proposed Rhodesia and Mashonaland Railways amalgamation—New locomotives for Egypt—Berlin underground construction—Floods in India—New system of sleeper treatment—Belgian National Railways in 1933

RHODESIA

New Railway Agreement

Arising out of the recent conference held at Capetown between the Governments of Southern Rhodesia, Northern Rhodesia and the Bechuanaland Protectorate and the Rhodesia and Mashonaland Railway Companies, legislation is being prepared for the amendment of the Railway Acts passed in 1926 and 1927 in the terms of the agreement signed at the conference. The primary purpose of the conference was to devise means to reduce the railway overhead charges. This is to be achieved by paying off their present debentures, worth £22,000,000, by means of a conversion scheme, and by the amalgamation of the two companies to form one concern, which will have the effect of improving administration and securing economies generally. It is agreed that if the scheme is not carried out by the companies within five years the whole position will be reviewed by the Governments to consider further legislation.

Conversion and Amalgamation

For the purpose of creating a favourable atmosphere for the conversion scheme the users have agreed that the railways shall gradually build up a reserve account representing 2½ years' debenture interest, and in exchange the railways agree to accept a smaller dividend provision. Until the reserve account has been built up it is agreed that there shall be no reduction of rates. A Rates Stabilisation Account not exceeding £500,000 will be introduced, and will be derived from (a) interest on the investment of the money in the reserve account, (b) surpluses derived from revenue from any special non-recurrent traffic, and (c) 90 per cent. of realised surpluses when the reserve account exceeds 2½ years' debenture provision. (The other 10 per cent. of the surplus will be added to the dividend as a bonus for that particular year.)

Under existing legislation the railways had accumulated reserves totalling £1,900,000 prior to the slump in traffic from 1930 onwards, and this amount had dropped to £401,000 in 1933, and could not be built up again under the present Act. In the past, the dividend provision started at £150,000 and could be increased to £225,000 a year, but under the new agreement no dividend can be provided

until the reserve account exceeds one year's loan provision, and then only commences at £75,000, rising as the reserves are built up to a maximum of £150,000.

The Prime Minister of Southern Rhodesia, the Hon. G. M. Huggins, explained the agreement at a large public meeting in Bulawayo, and expressed the opinion that it was a thoroughly businesslike agreement, fair to both the users and the owners of the railways, and that it would enhance the credit of the colony. Mr. Huggins stated that he was strongly opposed to any scheme for the purchase of the railways.

Popular Inclusive Excursions

For many years it has been the practice of the Rhodesia Railways to run special inclusive excursions to the Victoria Falls at holiday periods. The Rhodes' and Founder's holiday weekend, with the delightful winter weather prevailing in July, is always a popular occasion for a visit to the falls. This year the usual excursion was run leaving Bulawayo on Saturday afternoon and giving three days at the falls at the inclusive cost of £5 10s., covering meals and beds on the trains and accommodation at the Victoria Falls Hotel, which is operated by the railway company. For the first time residents of Salisbury also have been enabled to visit the falls within the actual holiday week-end, as a special express left Salisbury at 2.0 p.m. on Saturday, July 7, and reached the falls, 587 miles away, at 1.50 p.m. on the Sunday. The return express left at 8.30 a.m. on the Tuesday and arrived in Salisbury at 8.15 next morning. The inclusive fare for two days at the Falls Hotel, meals and beds on the trains, and 1,174 miles of rail travel on the through express, was only £8.

EGYPT

Twenty New Locomotives Sanctioned

The Egyptian Council of Ministers has now sanctioned the expenditure necessary for the purchase of twenty new standard gauge locomotives this year. Tenders for the supply of these engines will, in all probability, be called for during the next few weeks. The type of engine required has not yet finally been decided, but it is believed that a powerful type for mixed traffic

work on the lighter portions of the system is the most urgently required.

An additional grant—over and above the normal railway budget grant—has been sanctioned for the purchase of new wagon stock. Ten-ton all-steel covered goods wagons, 10-ton perishables vans, vacuum fitted for fast goods train working, and animal wagons are to be purchased this year.

Power House Extension Fore-shadowed

The Egyptian State Railways possess and operate their own electric power station for the supply of current to the Abu-Zaabal locomotive works, and to the adjacent shopmen's housing estate. Also, since the opening of the Government broadcasting station two or three months ago, this generating plant has supplied the power for the transmitting station. The additional demand, however, severely taxes the capacity of the existing generators, and it has now been decided to provide additional plant with a capacity of 500 kW. Tenders for this work will be called for shortly. It is not yet decided whether the plant will be steam or oil-engine driven, and it is understood that tenderers will be asked to put up alternative quotations for both. In any case, the contract will call for the complete installation, prime mover, alternator, and building work.

GERMANY

North-South Underground Line in Berlin

In THE RAILWAY GAZETTE of August 25, 1933, was briefly described the new North-South Stadtbahn underground line under construction from near the northern Stettiner terminus to the southern lines into Potsdamer and Anhalter termini. The line is entirely new, and, though it will run alongside the Berlin Underground lines, will not run over them as previously stated. The left bank of the Spree is followed near Friedrichstrasse, as providing the



Sketch map of the new North-South Berlin underground railway now being built

line of least resistance in construction. At the Stettiner station work was begun in February last and pushed forward rapidly so as to allow of the main line tracks disturbed being again available for the summer traffic in May. Work was carried on day and night to this end. Demolition at the Stettiner station and construction work in the tunnel are illustrated on page 310. The new Stettiner station east of the main line one will replace the present local station to the west; this will eventually be turned into a shed for electric trains. The new line is divided for constructional purposes into three sections, namely, Northern, from Stettin station to Friedrichstrasse (Dorotheenstrasse); Middle, from Friedrichstrasse to Potsdamer Platz; and South, from Potsdamer Platz to Kolonnenstrasse.

Greater Third Class Comfort now Available

In an editorial on page 708 of THE RAILWAY GAZETTE of April 27 last, it was mentioned that the German State Railway had decided to make a start with the upholstering of its third class carriages, one of these being illustrated on page 735 of the same issue. The first of these coaches has now been placed in service, incorporated in the Munich-Zurich express rakes.

Railway-owned Road Services

Recently the German State Railway has developed its road services considerably, and, on May 1 last, controlled 123 passenger bus services working 3,000 km. (1,864 route miles) and 550 goods lorry services working over 26,961 km. (16,750 route miles). Thus the total route length of railway-owned road transport in Germany amounted approximately to 30,000 km. (18,640 miles), corresponding to a Reichsbahn rail route length of about 53,000 km. (33,933 miles). In 1933, 5,480,000 bus passengers were carried and 6,940,000 bus km. (4,305,000 miles) run. Some 896,000 tons of freight were carried, involving 12,540,000 lorry km. (7,775,000 miles). At present the goods rolling stock consists of 627 lorries, 410 trailers, and 8 tractors. 1,750 new lorries have been ordered, and will probably be put into operation during the present year.

FRENCH WEST AFRICA

New Works and 1933 Results

The extension of the Ivory Coast Railway is now completed to Bobo-Dioulasso, 495 miles from the coast, and an order for 40 bogie covered wagons has just been placed to cope with the extra traffic. The line is to be still further prolonged to the banks of the Niger at Ségou, and the constructional work is to be commenced at the end of this year. Re-alignment of the first 250 miles from the coast is being carried out in order to make the line suitable for modern requirements, and similar work is now in progress on the Kayes-Niger Railway, where the

first 60 miles out of Kayes have been relaid with heavier rails and the grades and curves flattened.

A 75-mile extension of the Dahomey Railway has recently been opened, but the line is being carried on from the present railhead at Tehaourou, 236 miles from the coast, to the important centre of Parakou. Several diesel railcars are on order for use on this railway. Traffic on the metre-gauge Dahomey lines decreased greatly in 1933. The number of passengers carried fell to 236,784 from 349,783 in 1932, and the goods traffic to 42,217 tonnes from 66,814 tonnes. The receipts totalled 4,692,915 fr., compared with 7,384,890 fr. in the preceding year. The two sections of 600 mm.-gauge lines carried 42,650 passengers, against 55,945 in 1932, and 6,252 tonnes of freight against 7,607 tonnes. Receipts amounted to 303,807 fr., compared with 396,212 fr. in 1932.

INDIA

Flood Damage to Railways

Heavy rainfall in various parts of the country caused the overflowing of rivers, the devastation of large areas and damage to railways. Large portions of Assam and Eastern Bengal have been laid waste, the toll in human lives, cattle, homesteads and crops being heavy. Railway traffic was considerably disorganised on account of breaches. In the far north, several breaches and the collapse of three bridges on the Kalabagh-Bannu section of the North Western Railway necessitated the suspension of train services on portions of this section for several days, as transhipment was rendered impossible and unsafe. From similar causes through railway communications in parts of north Burma had to be suspended.

Jodhpur Railway Jubilee

The annual report of the Jodhpur State Railway for the year 1932-33 states that the most important event in the existence of the railway since its inauguration in 1882 was the celebration of its jubilee on March 3, 1933. His Highness the Maharaja personally attended the function and opened a pavilion in the Railway Sports grounds. He presented *sanads* to six members of the staff for exceptionally long and meritorious service. Commemoration plaques were given to 159 members of the staff who had been in service for not less than 25 years. An annual scholarship of Rs. 500 was instituted for the sons of railway employees. A life-size portrait of the Maharaja was presented to him by the staff.

Proposed New Preservative Treatment for Sleepers

A special committee, consisting of the eminent scientist, Sir C. V. Raman (Chairman), Messrs. Harvey, Wrench, Creighton, Irani and Sefton (members), recently met at Simla to consider a new process of timber preservation, with special reference to its application to railway sleepers. The process, dis-

covered by two scientists at the Forest Research Institute at Dehra Dun, consists of the injection of a mixture of arsenic pentoxide and potassium dichromate under certain atmospheric conditions. It is possible that the process may be experimentally tried in certain railway areas.

Railway Conference Association Committee Meetings

Bangalore was the venue of three committees of the Indian Railway Conference Association. Mr. F. R. Hawkes, Chief Commercial Manager of the North Western Railway, presided over the Commercial Committee meeting, while Mr. Parsons, of the M. & S.M. Railway, was Chairman of the Operating Committee. Both committees went through a large agenda relating to rates and fares, general conditions of rail transport and various matters connected with the haulage of traffic. The Medical Section, consisting of the Chief Medical Officers of all the railways with Sir Hasan Suhrawardy as Chairman, considered subjects such as Colour Vision Tests, Anti-Malaria Measures and the Disinfection of Railway Carriages.

Fare Reductions Proposed on the E.B.R.

At a meeting of the Eastern Bengal Railway Local Advisory Committee, it transpired that from April 1 to June 26 the total earnings of the railway increased by 9 per cent. as compared with the corresponding period of the previous year, but a decline in coaching earnings amounting to Rs. 36,000 was viewed with anxiety. The number of passengers carried in this period fell by 78,50,000 or 23 per cent. A member proposed that the Railway Board should be approached for sanction to reduce third class fares as an experimental measure, as was being tried on the North Western Railway. The Agent explained that the term of reduced fares had been extended for a further period of six months, and that on the conclusion of this experiment the Railway Board would decide whether or not similar reductions were to be tried on other State railways.

BELGIUM

Railway Results in 1933

The operating receipts of the Belgian National Railways in 1933 were 2,329,900,000 Belgian fr., a drop of 5 per cent. compared with 1932, and the working expenses totalled 2,343,200,000 Belgian fr., a decrease of 10 per cent. The length of line open was increased by 20 km. to 4,861 km. (3,020 miles) by the opening of the Brussels (Midi)-Denderleeuw line. The number of passengers carried fell by 3 per cent. to 185,200,000, and the goods handled by 1.1 per cent. to 55,000,000 tonnes. During the year the staff was reduced by 2 per cent. to 85,098, and the money expended in salaries and wages (excluding pensions) fell from 1,537,100,000 to 1,383,100,000 Belgian fr.

NEW PASSENGER COACHES FOR THE SWISS FEDERAL RAILWAYS

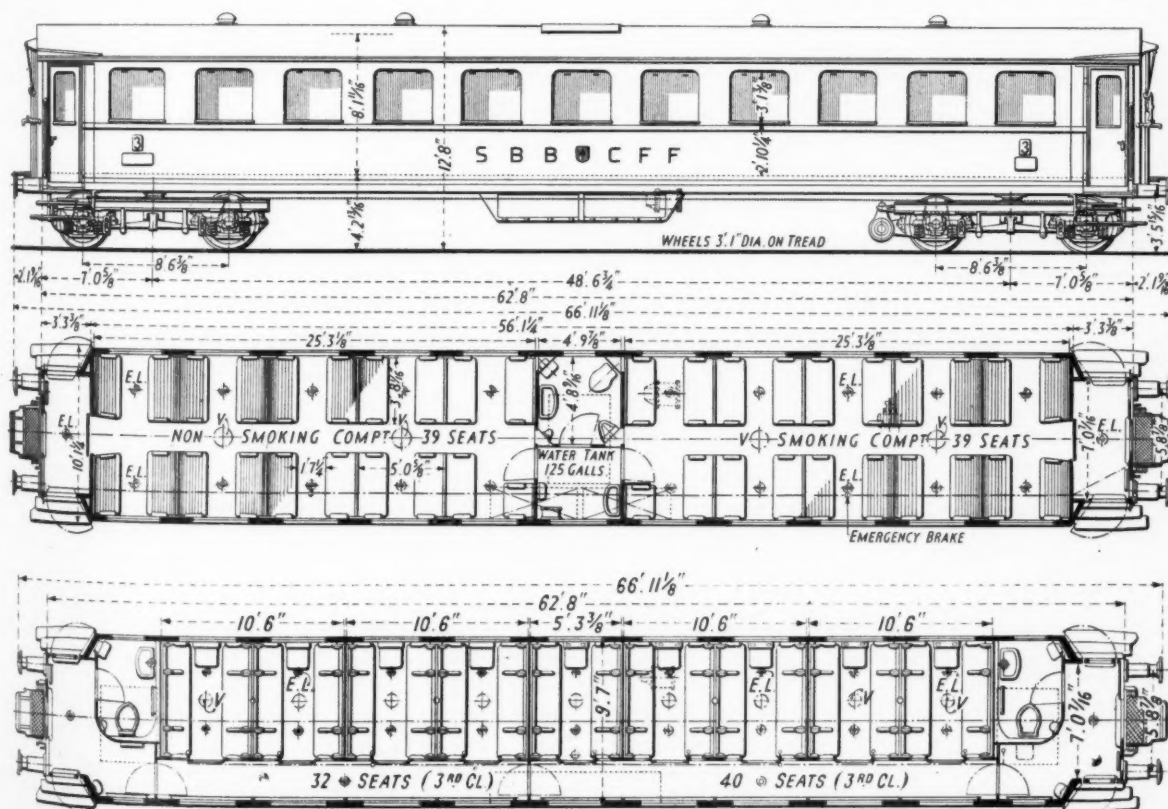
Light electrically-welded bogies are used, with reduced overhang and improved springing. Other constructional innovations are introduced and the Carrecla system of luminous publicity is installed

THERE have recently been delivered to the Swiss Federal Railways thirty new third-class passenger coaches embodying a number of novel features. These coaches, Nos. 9101-9130 of the C^m series, are eight-wheeled vehicles with a seating capacity of 78 and a tare weight of 38 metric tons (37 tons 8 cwt.). The body dimensions are the same as for earlier vehicles of the same series excepting the length, which is 35 m. (1 ft. 1½ in.) greater in the new coaches. Nevertheless, the tare weight is 900 kg. (1,985 lb.) less than that of the older coaches.

The new vehicles, which are intended for internal traffic, were designed by the Fabrique suisse de Wagons et d'Ascenseurs, and they have been built by this company and the Société Industrielle Suisse, Neuhausen, at a cost of 90,000 francs (£5,600 at 16 fr. = £1) each. They are fitted with Westinghouse double brakes and with brake-shoe adjusting gear of the Stoplex type by the Ateliers des Charmilles, Geneva. The leading dimensions of the new coaches are shown on the accompanying drawing.

Special attention has been paid to securing good riding qualities, to which end the distance between the bogie pivots has been increased to 14.80 m. (48 ft. 6½ in.), com-

pared with 13.15 m. (43 ft. 1¾ in.) in the earlier coaches, thus reducing the overhang to 2.80 metres (9 ft. 2¼ in.), measured from the centre of the bogie pivot to the extremity of the buffers. The performance of the new vehicles since they have been placed in service shows that the increased spacing of the bogies, together with certain constructional modifications necessitated thereby, has been completely effective as regards the smoother running of the coaches. The changes in the bogie construction include a reduction of 100 mm. (3½ in.) in the diameter of the wheels. Also, instead of being mounted transversely, the elliptic springs are placed longitudinally, with hangers inclined 2° 40' outwards. This arrangement permits the use of long leaf springs, for which a new cross-section, developed by the firm of Krupp, is employed, thus securing good lubrication of the leaves. The new springs, 1.70 m. (5 ft. 7 in.) in length, consist of eight leaves, 120 × 1½ mm. (4.72 × 0.51/0.63 in.), and give a deflection of 2.15 cm. per metric ton (0.86 in. per ton). The old bogies have four elliptical springs 0.914 m. (3 ft.) in length with 2 × 7 leaves of 90 × 9 mm. (3.54 × 0.35 in.) section. The hangers are 210 mm. (8¼ in.) in length and have a restoring force of 980 kg. (2,161 lb.); the distance between the points of support of the springs



Elevation and seating plans of new third class coaches for the Swiss Federal Railways

is 1,956 mm. (6 ft. 5 in.) compared with 1,640 mm. (5 ft. 4½ in.) in the older coaches. The axle springs are helical and in pairs, as used in the earlier coaches, and are of 208 mm. (8¼ in.) diameter, with five turns of 31 × 31 mm. (1.22 × 1.22 in.) section, giving a deflection of 2 cm. per metric ton (0.8 in. per ton). These springs rest on compensating beams hung from the axle boxes. The pivot, the lateral supports, and the axle springs rest on rubber pads 3.5 cm. (1¾ in.) in thickness, the object of which is to damp out vibrations and, in particular, reduce the transmission of noise to the coach body.

The new bogie is characterised by its lightness and by the easy access to all its parts. The bolster and the bogie frame are of rolled sections assembled by electric welding; and the cast-steel horn-block guides are also welded to the frames. The wheel sets, Type E, have been built for the first time by the Fabrique de Locomotives, Winterthur, with cast-steel wheel centres. The weight of the new bogies is 5,850 kg. (5 tons 15 cwt.), representing a saving of about 800 kg. (15 cwt. 3 qr.), compared with the earlier construction; this figure does not include the axle-driven dynamo, which weighs about 300 kg. (6 cwt.).

Body Details

The reduced overhang at each end of the coach has necessitated modification in the draw and buffer gear. The expensive P.L.M. system, with its large springs, has been replaced by conical springs and a buffer-compensating beam connected to the draw gear. A 22-ton conical spring, as used in goods wagons, is employed as a draw spring, and similar 16-ton springs are fitted in the buffers, which will accommodate stronger springs if such are found to be desirable. The brake pipes and the heating cables pass above the buffer-compensating beams, and the cable holder is of cast aluminium in two parts.

The body of the new coaches also presents a number of interesting features. The walls are of steel, welded electrically to the steel frame, electric welding being also used for the straps or cover plates and between the stanchions and sills. The main girders of the body are exposed for two-thirds of their height and all their length. This, together with the bevelling of the doorways and window openings, and the adoption of the inscription SBB+CFF, results in a pleasing general appearance at no extra cost. The width of the steps has been increased 50 mm. (2 in.) and long handrails of bright metal are fitted. The Ronai system of suspension and coupling is used for the vestibule connections, with provision for their easy replacement, and with double-retaining hooks, the front teeth of which are used during shunting and when the connections are stiff in winter.

As shown by the seating plan on page 301, the coaches are of the centre-corridor type with twenty groups of four seats each, except where two seats are omitted to allow for the doors of the lavatory at the centre of the coach. The seats are 1 ft. 8½ in. deep, 3 ft. 8½ in. wide, a little lower than usual, and provided with foot-rests. Improved lighting is installed, a 25-watt lamp being mounted above each group of four seats. Two ventilators, instead of five, are provided in each compartment, experience having shown that ample ventilation is thus secured.

The w.c. and antechamber are somewhat larger than in the earlier coaches, with a wash basin in each and improved sanitary fittings. The water tank, of 570 litres (125 gallons) capacity, is accessible from the roof, and special attention has been paid to the prevention of freezing. In nine of the new series of coaches, Nos. 9101-9109, the electric heating of the lavatory and w.c. is effected by two radiators of 500 volts 740 watts each, and the water tank is heated by two immersion elements of 250

volts 500 watts each, fed by a 1,000/250-volt transformer and controlled automatically by a regulator, which reduces the power input when the water rises above 40° C. (104° F.) and restores full supply when the temperature falls below 25° C. (77° F.). In the remaining coaches, Nos. 9110-9130, four 250-volt 600-watt heaters are used, two being in the water tank; this arrangement eliminates the transformer and temperature regulator, and makes possible more effective storage of heat. Tests indicate that, with an outside temperature of -10° C. (14° F.), there is no danger of the water tank freezing within 24 hours after the heaters have been in use for five or six hours, hence there is no need to empty the tanks of coaches which are idle for less than 20 hours a day. The taps may freeze under such conditions, but they thaw after the heating has been on for 1 to 1½ hour. As an experimental measure, the taps in some of the coaches (Nos. 9101-9120) have been fitted with 36-volt 20-watt heaters, run from the battery and provided with 5/20° C. (41/68° F.) automatic temperature regulators. The heating of the passenger compartments is similar to that in the older coaches of the same type, the allowance being 14 kW. per compartment, or about 300 watts per cu. metre (8.5 watts per cu. ft.).

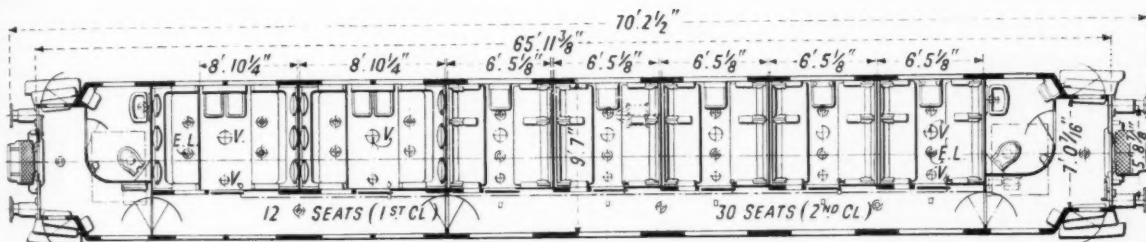
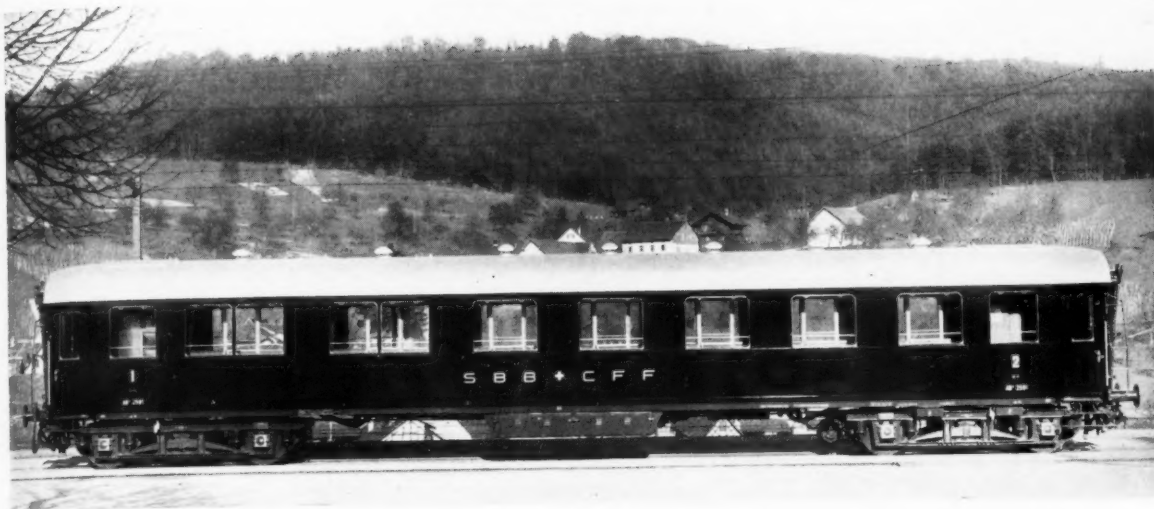
At the end of each compartment, over the door, there is a Carrecla luminous publicity apparatus. This equipment, made by the Rapid S.A. Bruggen, and now used for the first time in railway vehicles, comprises a series of 35 transparencies, each 30 × 30 cm. (11¾ in. square), mounted in the form of a band, which is drawn over the screen at the rate of 1 m. (3 ft. 3¾ in.) per minute. A 45-watt electric motor drives the picture rollers through reduction gearing, and reverses automatically when the end of the band is reached. The transparencies are illuminated night and day by two 25-watt lamps as long as the apparatus is working and electricity supply is taken from the train lighting set. The system generally was described in greater detail in THE RAILWAY GAZETTE of April 14, 1933.

Coaches for International Traffic

In addition to the foregoing, twenty new coaches for international traffic have recently been built for the Swiss Federal Railways. They are of series AB^{III}, Nos. 2690-2699, and C⁴⁰, Nos. 8965-8974, the letters A, B and C representing first, second and third class respectively. The leading dimensions of these cars correspond closely to those already described, the most noteworthy difference being that the length of the first and second class design has been increased from 20,400 mm. (66 ft. 11 in.) to 21,400 mm. (70 ft. 2½ in.), making it the longest and at the same time the heaviest vehicle of the Swiss Federal Railways. The coaches are of all-metal construction, the steel frame having been additionally strengthened by supplementary welded members. Both the first and third class appointments show an improvement on previous types. The third class coach, with side corridor, is the first all-steel third class vehicle of this type to be built for Switzerland.

The ten first and second class coaches have been built by the Société Industrielle Suisse, Neuhausen, and the third class vehicles by the Fabrique suisse de wagons et d'Ascenseurs, S.A., Schlieren. The two types have been standardised as far as possible.

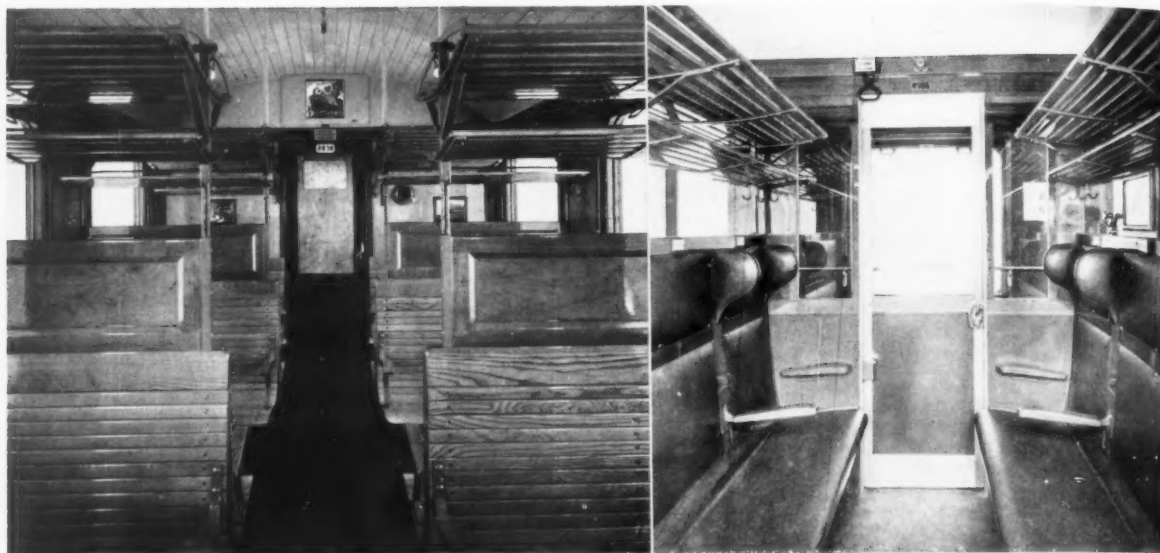
Various modifications have been made in the design of the bogies of the first and second class coaches to give the greatest smoothness of running. The axles are 3.0 m. (9 ft. 10 in.) apart, instead of 2.60 m. (8 ft. 6¾ in.) as in both the third class international coaches and those for internal traffic. The ends of the bolster are supported by



General view and seating plan of new first and second class carriages, Swiss Federal Railways



Interiors of (left) first class and (right) second class compartments of the new Swiss Federal coaching stock



New Swiss Federal third class stock; interiors of (left) centre corridor open type coach and (right) a compartment of one of the side corridor type coaches

laminated springs. Stout rubber blocks act as additional shock absorbers between the bolster and the longitudinal springs and between these springs and the bogie frame.

With the completion of these coaches the number of vehicles on the Swiss Federal Railways adapted by their dimensions for widespread international use will be 304. All are distinguished by the letters RIC (Regolamento

Internazionale Carrozze) on the side panels. The initials of the countries where working is permitted follow the letters. A starred initial indicates that in the country in question the vehicle is restricted to certain lines. The coaches are designed to have as wide an area of unrestricted use as possible, but they are excluded from countries where the Hardy vacuum brake is standard.



A view of the tastefully equipped refreshment room serving the new Nos. 3, 4, and 5 platforms at Bristol, Temple Meads station

RAILWAY CRUISING IN AUSTRALIA

First introduced by the Victorian Railways in 1922, cruising trains, unlike the Northern Belle in this country, are organised not for pleasure, but to allow town workers to see conditions prevailing in the rural districts



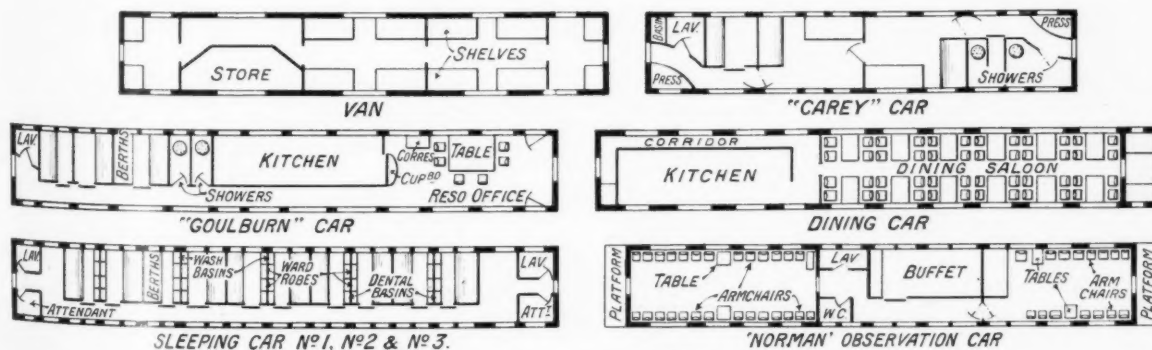
Interior of observation car of the Reso train

CRUISING by railway was inaugurated in Australia in 1922 when the Victorian National Resources Developmental Train, a de-luxe train providing a high standard of accommodation and organisation, was brought into being. The genesis of these tours lay in the realisation on the part of Mr. Harold W. Clapp, Chairman, Victorian Railways Commissioners, of the outstanding need for leaders in city and rural industries acquiring a better knowledge of each other, and of the immense possibilities of the State of Victoria.

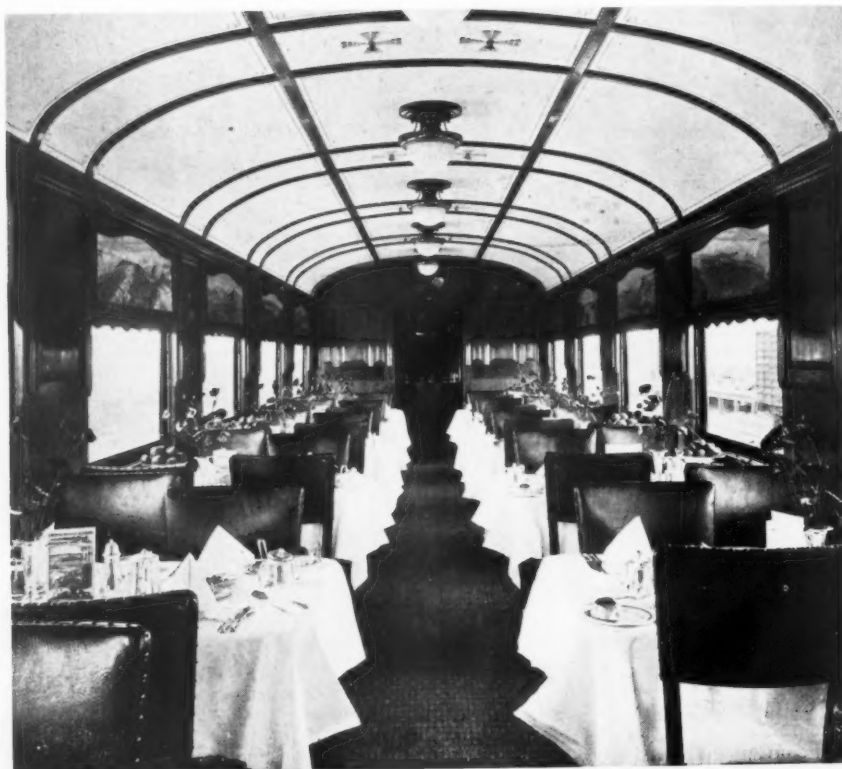
The train used for these tours is known as the Reso train, the name being an abbreviation of the word Resources, and on it 60 passengers can be accommodated. To date, 22 tours have been run in Victoria apart from tours to Queensland, Western Australia, New South Wales and Central Australia. The Reso train consists of a parlour observation car, three sleeping cars, dining car, office car, staff car, and guard's van, as shown on the accompanying diagram. The parlour observation car is furnished with wireless and gramophone, and facilities for dispensing liquid refreshments, tobacco, cigars, &c. This car is also provided with special maps and diagrams, including those having direct relation to the country traversed, such as closer settlement areas, irrigation, afforestation, &c. On the rear of the parlour observation car is a large illuminated sign "See Australia First—Start with Victoria," surrounding a map of Australia with Victoria picked out in red. Twenty persons are accommodated in each sleeping car, while the dining car will seat 48. The office car con-

tains typewriters and mimeograph duplicator, and is fitted with two hot and cold shower baths for the use of passengers and sleeping accommodation for the officials. Part of the guard's van is used as a store, and the remainder is equipped with temporary two-tier bunks for the crew. The total length of the train, including the engine, is 622 ft. The train weighs 422 tons, and as it stands on the rails ready for the road its value is probably about £60,000.

The Reso party, as in the case of the L.N.E.R. Northern Belle cruising train, lives on the train, eating and sleeping and receiving attention under conditions which make the train a very high class hotel on wheels. They enjoy special telegraph facilities and a special mail bag, and supplies of the Melbourne daily newspapers are forwarded to the train while on tour. Arrangements are made through the local municipal authorities or other public bodies for the party to inspect representative farms, factories, business establishments and any large Governmental undertakings. Usually half a day at each place is sufficient, but sometimes a full day is required. The local residents place at the disposal of the party a sufficient number of motor cars, between 20 and 25, for the purpose of conveying the party around their respective districts. In the evening the local residents generally arrange a smoking social at which members of the Reso party are enabled to meet repre-



Plan of the passenger and staff accommodation of the Reso train



The dining and kitchen accommodation of the Australian Reso cruising train. Left: interior of the restaurant car; this performs the functions of a travelling hotel as passengers may invite their own guests to dine with them at calling places en route. Below: the conveniently fitted and roomy kitchen

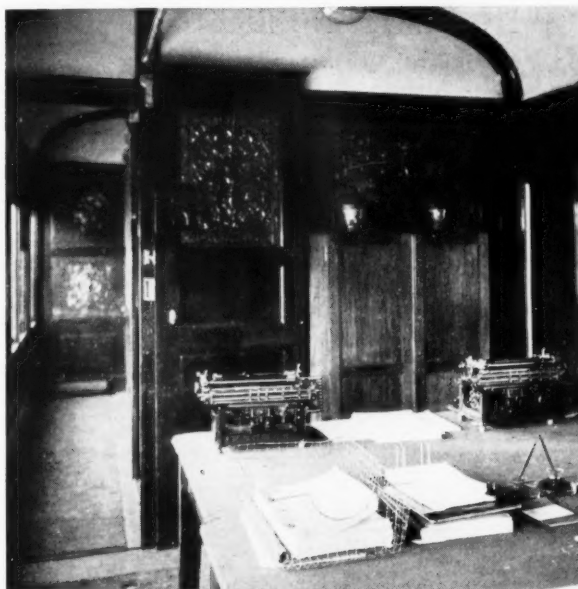


representative residents and discuss features viewed during the afternoon's inspection.

The Betterment and Publicity Board of the Victorian Railways controls the organisation on behalf of the Railways Commissioners, and a Member of the Board accompanies the tour as officer-in-charge. A shorthand writer and typist is at the disposal of passengers for the performance of any clerical work required. If, as usually happens, the train goes through water conservation and distribution areas, forest regions, closer settlement districts, and so on, officers representing the appropriate public departments make the tour to inform passengers of all phases of these subjects. The trip lasts approximately a week—Monday to Saturday afternoon. As a rule the departure from Melbourne is immediately after midnight on Sunday. The usual fare is £16 10s. and includes everything, except liquid refreshments, tobacco, and extra meals for invited guests of passengers.

Endeavour is made to secure representation of primary, manufacturing, banking and other industries, of various phases of commercial life generally, and of both town and country interests. The Commissioners themselves determine who shall go, and reserve the right to reject any application. Each passenger is given a booklet containing comprehensive information concerning the resources of the State and also receives with his ticket a folder containing hints in preparing for the journey, and an outline of the facilities available on the train. Each morning is circulated the *Reso Daily Bulletin* which is the train newspaper and contains information regarding each of the districts to be visited.

Following the phenomenal success of the Victorian tours, the Australian Railways Commissioners are now operating similar tours over their respective systems. It has been urged that these cruises should be extended throughout the Commonwealth so that overseas investors and fathers, who might desire to settle their sons on land, might see for themselves the rural areas in comfort and under an



The office on the Reso train

organisation that ensures their receiving first-hand information. The Australian Railways Administration has appointed a Central Executive to organise special tours throughout the Commonwealth, and particulars of these tours have been circulated overseas with a view to the tours being availed of by visitors as well as Australians. In addition, it has been made practicable for tourist or shipping groups to charter an entire tour and arrange its own booking.

NEW 4-8-2 TANK LOCOMOTIVE FOR SOUTH AFRICAN SERVICE

THE illustration accompanying this article shows a large 4-8-2 side tank locomotive recently built by R. & W. Hawthorn, Leslie & Co. Ltd. for working heavy mineral traffic on the private lines of the Randfontein Estates Gold Mining Co. (Witwatersrand) Ltd. The engine conforms to the requirements of the South African Railways for the 3 ft. 6 in. gauge and is intended to operate over curves of 290 ft. radius. The rigid wheelbase is 12 ft. 9 in. and the total wheelbase 29 ft. 4 in.

Steam admission is by balanced slide valves, operated by Walschaert valve gear. The piston rods and valve

spindle glands are fitted with S.E.A. packing rings. Skefko self-aligning roller bearings are used for the coupling rods, connecting rod big ends and return crank rods. A four-feed Eureka sight feed lubricator supplies the slide valves and pistons. Grease-gun lubrication with Tecalemit nipples is provided for the other motion parts.

Further equipment includes two Gresham and Craven No. 9 self-acting injectors for boiler feed, vacuum brake gear for the train, steam and hand brakes on the engine.

The engine develops a tractive effort at 75 per cent. working pressure of 28,800 lb. The leading dimensions are as follow:—

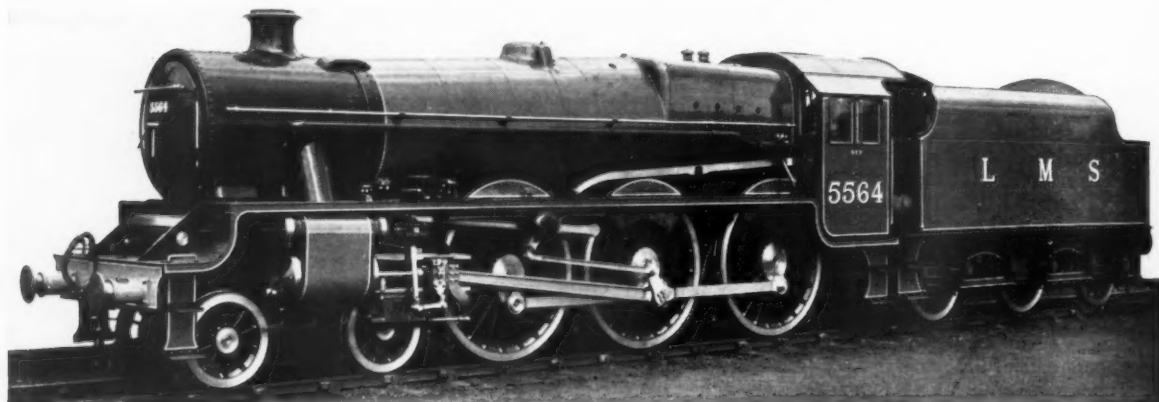
Cylinders (2) dia.	.. 20 in.
Piston stroke	.. 24 in.
Wheels, coupled,	
diam.	.. 3 ft. 9 in.
Boiler, heating surfaces—	
Firebox	92 sq. ft.
Tubes	.. 1,310 "
Total	.. 1,402 "
Grate area	.. 24.5 sq. ft.
Boiler pressure	.. 180 lb. per sq. in.
Weight of engine in working order	.. 71 tons.

The capacity of the side tanks is 1,720 gallons of water and the bunker carries 4 tons of coal.



THREE-CYLINDER 4-6-0 TYPE EXPRESS LOCOMOTIVES, L.M.S.R.

Built by the North British Locomotive Co. Ltd., Glasgow



ON page 728 of the issue of THE RAILWAY GAZETTE dated April 27, 1934, there appeared a short article illustrating and describing the first of a new series of three-cylinder 4-6-0 type express locomotives which had then just recently been completed at the L.M.S. Railway works at Crewe to the designs of Mr. W. A. Stanier, Chief Mechanical Engineer.

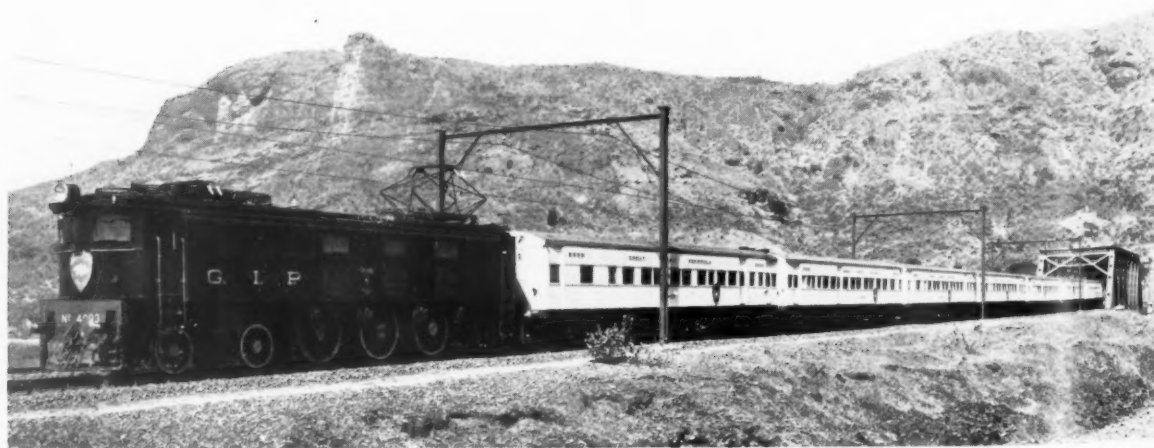
Altogether, 113 of these engines are being constructed, i.e., 53, Nos. 5552 to 5556 and 5607 to 5654 at Crewe, and 50, Nos. 5557 to 5606 by the North British Locomotive Co. Ltd., Glasgow, whilst the remainder, Nos. 5655 to 5664 will be built at the company's Derby works.

The engine illustrated herewith, No. 5564, is one of the series built by the North British Locomotive Co. Ltd. It is the same in all respects as the Crewe engine illustrated in the article above referred to, except that it has a larger tender, carrying 9 tons of coal and 4,000 gallons of water, as compared with 7 tons of coal and 3,500 gallons of water accommodated by the tender as built at Crewe.

The engine in working order weighs 80 tons 15 cwt. and the tender 54 tons 2 cwt., a total loaded of 134 tons 17 cwt.

For the convenience of readers we reproduce the leading dimensions of the locomotive, which are as follow:—

Cylinders (3)	.. .. .	17 in.
Piston stroke	.. .. .	26 in.
Wheels, coupled, diameter	.. .. .	6 ft. 9 in.
Bogie, diameter	.. .. .	3 ft. 3 in.
Wheelbase, coupled	.. .. .	15 ft. 4 in.
" engine, total	.. .. .	27 ft. 5½ in.
" engine and tender	.. .. .	54 ft. 3½ in.
Boiler working pressure	.. .. .	225 lb. per sq. in.
" diameter outside, smokebox end	.. .. .	5 ft. 0 in.
" " firebox end	.. .. .	5 ft. 8½ in.
Superheater element tubes—		
(14) 1½ in. diam. outside × 11 S.W.G.	.. .. .
(14) large tubes 5¼ in. diam. outside × 7 S.W.G.	.. .. .
(160) small tubes 2 in. diam. outside × 11 S.W.G.	.. .. .
Heating surface, tubes	.. .. .	1,462.5 sq. ft.
" " firebox	.. .. .	162.4 sq. ft.
Total	.. .. .	1,624.9 sq. ft.
superheater	.. .. .	227.5 sq. ft.
Combined total	.. .. .	1,852.4 sq. ft.
Grate area	.. .. .	29.5 sq. ft.
Tractive effort at 85 per cent. boiler pressure	.. .. .	26,610 lb.



Proposed tourist de-luxe special train, Great Indian Peninsula Railway, composed of tourist saloon cars and hauled by a standard express electric locomotive

RAILWAY NEWS SECTION

PERSONAL

Mr. Bertram F. Tee has been promoted from Assistant and Chief Clerk to Commercial and Operating Assistant to the Superintendent of Road Transport, G.W.R. Mr. Tee



Mr. B. F. Tee.

Appointed Commercial and Operating Assistant to the Superintendent of Road Transport, G.W.R.

entered the service of the Great Western Railway Company in 1890, and, after gaining several years' general station experience in the Reading district, served in the Time Bill, Rates and Fares, and Staff Sections of the office of the Superintendent of the Line at Paddington. In 1922, at the beginning of a decade of rapid motorisation and phenomenal changes in transport methods, he joined the Road Transport Department of the railway at its inception. Subsequently Mr. Tee has been associated with several inter-railway committees dealing with road transport problems.

With reference to the notice, on page 278 of our last issue, of Mr. A. B. MacLeod's appointment, we are now informed by the Southern Railway that by an error Mr. MacLeod's designation was given to us wrongly. Mr. MacLeod is actually Assistant Western Divisional Locomotive Running Superintendent of the Southern Railway.

We regret to record the death, on August 11, of Mr. A. G. Smith, who retired from the position of Canals Manager, Bath, G.W.R., in 1922. Mr. Smith joined the office of the Chief Engineer from that of the District Engineer, Newport, in 1891 and in

1897 was appointed Chief Clerk. In 1902 he was promoted to be Office Assistant, in which capacity he continued until appointed Canals Manager in 1916. At the funeral service at Bath, the Chief Engineer and staff were represented by Mr. F. C. Warren, Chief Clerk; Sir Felix Pole also attended to show his respect and esteem for Mr. Smith, under whom he served in his early railway days.

The King of Egypt has conferred the Order of the Nile upon the following Sudan Railways officials:—

Fourth Class

Mr. J. A. B. Jones, M.B.E., Superintendent Electrical Engineer;

Mr. W. H. Mackenzie Brown, Maintenance Engineer;

Mr. R. Gordon, Dockyard Manager.

Fifth Class

Mr. R. Stephens, Chief Storekeeper; Mr. J. Cameron, District Traffic Manager;

Mr. L. W. Chappell, Fleetmaster; Mr. F. J. Sparks, Superintendent, Hotels & Catering Services;

Mr. A. S. Denson, District Locomotive Foreman;

Mr. E. G. Baker, Signal Inspector (retired).

Mr. Raymond Morgan, Consultant in Technical Publicity, has left Cliffords Inn and removed to 22a, Queen Anne's Gate, London, S.W.1; telephone, Victoria 8925.

The British Thomson-Houston Co. Ltd. has appointed Mr. J. L. Dixon Manager of the London District and Mr. C. G. Seeley Assistant Manager.

Mr. John Watson Vaughan has been appointed Secretary and Solicitor to the Locomotive Manufacturers' Association, as from August 1. He was formerly Assistant Secretary of the West Yorkshire Coal Owners' Association in Leeds.

INDIAN RAILWAY STAFF CHANGES

Messrs. D. Cardew, Chief Mechanical Engineer, W. O. Chalk, Superintendent, Mechanical Workshops; L. E. Brock and H. Jackson, Deputy Chief Mechanical Engineers, N.W.R., have been confirmed in their appointments as from May 25.

Mr. J. D. Mollett, M.C., has been appointed to officiate as Deputy Agent (Organisation), N.W.R., as from June 19.

Messrs. H. Howe, K. Peddie and R. Mair have been appointed Officiating Deputy Chief Engineers, E.I.R., as from March 6, April 29 and June 8 respectively.

Rai Bahadar P. L. Dhawan has been appointed Senior Government Inspector of Railways, Circle No. 5, Bombay, as from July 13.

Mr. A. G. Harvey has been appointed to officiate as Deputy Chief Accounts Officer, Burma Railways.

Mr. I. S. Puri has been appointed to officiate as Deputy Chief Accounts Officer, N.W.R., as from July 5.



Station garden at Knutsford, awarded first prize for the third year, as the best on the Cheshire Lines

Railway Developments in Berlin

In our Overseas columns on pages 299-300 will be found a few details of this new underground construction work, some idea of which is also given by the two upper illustrations on this page. The bottom picture depicts a suburban station in Berlin



Above: Demolition work in progress opposite the Stettiner station in Berlin in preparation for the tunnel which is to connect that station with the Anhalter station in South Berlin

Right: The tunnel in course of construction. Details of this new north-south line, which will connect important main-line stations on opposite sides of the River Spree, were given in our issue of August 25, 1933



New Berlin suburban station at Sundgauer Strasse, with all-welded platform roof, which was opened on July 1 last. For some years past the welding instead of riveting of this type of structure has become popular in Central Europe and it has been adopted in several new and reconstructed stations. An article in the August issue of our associated monthly publication, "The Railway Engineer," presented a review of the present position with special reference to modern German practice

THE MONTH'S RAILWAY LAW

The Carriers' Duty to Take Care

In case of accident a passenger by rail, tram, omnibus, or other form of transit may have a right of action for damages quite apart from contract. He has a right to sue "in tort" if the accident was due to the negligence of the company's servants. At first sight the distinction between contract or tort would seem to be immaterial, but the question becomes very important when the company is in process of liquidation. As soon as that happens the right to prove for damages in the winding up must arise in contract if it is to be admitted. The damages are at this stage unliquidated, and the liquidator cannot allow a claim for unliquidated damages arising "otherwise than by reason of a contract promise or breach of trust," within the Bankruptcy Act, 1914, S. 30, or the Companies Act, 1929, S. 262.

An interesting case on this point arose recently in the Courts under the title *Re Great Orme Tramways Co.* (June 9).

Accident Claim in Winding Up

The facts in the Orme Tramways case were that Miss Beesley, a confectioner's assistant, went to Llandudno for her holiday in August, 1932. When there she took a return ticket for an excursion by tram to the Great Orme and back. On the way back a drawbar broke and the tramcar got out of control and ran into a stone wall. The driver was killed, and many passengers, including Miss Beesley, were seriously injured. She was left a permanent invalid and lost the sight of her left eye. In July, 1933, an order was made for the winding up of the company and Miss Beesley put in a claim for £3,140 damages for negligence. The liquidator rejected this on the grounds mentioned in the last paragraph and Miss Beesley then sought to amend by substituting a claim for damages for breach of contract for safe carriage, of which the ticket was the evidence. Several railway cases were cited as to claims of this kind, viz.: *Marshall v. Newcastle & Berwick Railway Company*, 11 C.B. 653, and *Thomas v. Rhymney Railway Company*, L.R. 6 Q.B. 266. The liquidator was still uncertain whether he should admit the claim and took the matter before Mr. Justice Eve for decision. That Judge decided that the claim in contract could be substituted for the claim in tort and he directed the liquidator to prepare a statement showing the amount of the assets of the company, the amount of the claims, and the dividend that it would be possible to pay on them. The case shows how necessary it is to distinguish the exact ground of claim in actions for damages for personal injuries, particularly where the company is insolvent. Passengers by rail, generally speaking, have a much stronger defendant to deal with

financially in a railway company if anything goes wrong than in any other class of transport, and the point is one which travellers should have in mind. It is at least a consoling thought at holiday times.

Railway Carriage Rebate on Milk

United Dairies (Wholesale) Limited v. Walley. Times, June 26.

The United Dairies won their appeal in the House of Lords in this case and the House of Lords reversed the Court of Appeal and Mr. Justice Macnaghten, although Lord Atkin dissented from the other law Lords. The case involved the construction in the standard "milk sale" agreement, of the words "less a sum equal to the railway carriage to London." The respondent, a farmer who was selling his milk and was to deliver milk to the dairy company's creamery, was to receive a sum specified for each month in the year varying with the seasons per imperial gallon, less a sum equal to the railway carriage to London and $\frac{1}{2}$ d. per gallon. The cost of carriage by rail of milk from Calveley in Cheshire where the milk was delivered, to London was 1-76d. per imperial gallon during October and November 1930, and 1-71d. per imperial gallon from December 1930 to September 1931. The dairy company installed railway tank wagons to convey the milk and was thus entitled to a rebate on the special rates charged by the railway company. The dairy company deducted a sum equal to the railway carriage to London which Mr. Walley would have paid himself, and pocketed the rebate accruing by reason of the large quantity. Mr. Justice Macnaghten and the Court of Appeal held that the dairy company was not entitled to do so, but the House of Lords took the view that the words "a sum equal to the railway carriage to London" described a conventional sum and not the actual cost. That being so the deduction should have been 1-76d. and 1-71d. per gallon for the two periods in question. The farmer, they said, was not entitled to take advantage of the concessions obtained by the dairy company from the railway company as a result of the dairy company's special equipment.

Lord Atkin in his dissenting judgment expressed the opinion that the cost or charge for carriage to London was the cost or charge to the purchaser of the milk. The farmer had completed his contract by delivery at the creamery at Calveley and the purchaser was then master of the destination. The words could not refer to the cost or charge of carriage from a station with which the farmer had nothing to do.

The history of the case shows that it is no more easy for business people to express their meaning plainly in a mercantile agreement than it is for lawyers. Even now it does not seem

very clear what the parties really intended that the phrase should mean.

Contribution in Actions for Negligence

The last report of the Law Revision Committee deals with a matter which may be of considerable interest to those concerned with "accident" cases. It is often the case that an accident is caused by the negligence of more than one person or at least that the liability for the accident falls upon two or more persons or companies. Thus in the case of railway companies a passenger injured in a collision may have a cause of action against both the railway company that owns the line and the company whose train was actually upon the line, or, to put it shortly, against the "owning" and the "working" companies, where the accident is due to the negligence of both.

In this and similar cases the rule hitherto has been that there is "no contribution between wrong doers," and if the passenger brings his action against one company and succeeds, that company cannot proceed against the other company for contribution of its fair share of the liability. In the Admiralty Court there is a power of apportionment and the Court assesses the exact proportion of the liability which each of the wrong doers is called upon to pay. But there is no such rule at Common Law and here the Committee considers that there should be a change in the law and that the amount to be paid by the persons jointly liable should be fixed by the Judge.

The further proposal on the same subject is that the injured person, if he fail to recover against the one should not be barred from proceeding against the other. The present practice is to proceed against them both jointly, but if the injured person sues one defendant only and fails to recover against him he loses his right of suing the other. No doubt the difficulties that have arisen in cases of injuries by motor-cars have brought matters to a head in this connection. The new proposals are all to the good and will remove an anomaly in the law.

Jurists for some years have taken the view that the rule as to "no contribution between joint wrong doers" ought to be amended, and it seems probable that an Act will be passed putting this into effect.

MORE ZEPHYRS.—The Chicago, Burlington & Quincy Railroad has just ordered from the E. G. Budd Manufacturing Company, two further streamlined trains of the Burlington Zephyr type. Compared with the Zephyr, which was described in detail in the *Diesel Railway Traction Supplement* for May 18, additional passenger accommodation will be available owing to the elimination of the mail compartment. The new trains are to be placed in regular daylight service between Chicago and the Twin Cities (Minneapolis St. Paul).

Ministry of Transport Accident Report

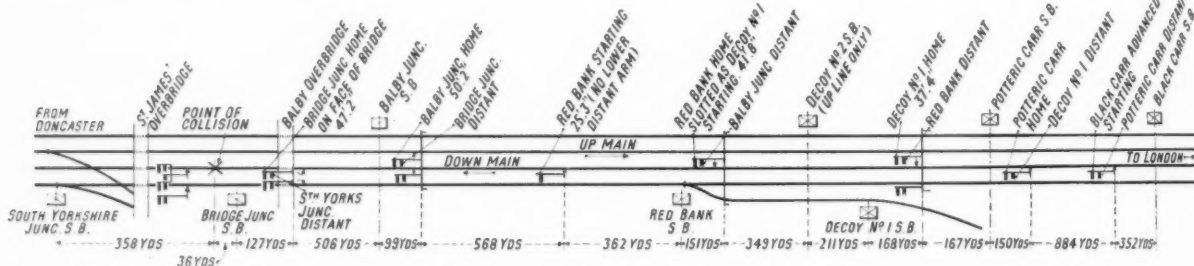
Doncaster; London & North Eastern Railway; March 28

In a dense fog the second portion of the 10.25 p.m. Scottish express from King's Cross, referred to hereafter as the 10.32, ran into the first portion. Both trains were moving, and their relative speed was apparently some 15 or 20 m.p.h. There were no serious personal injuries and there was no derailment. The last vehicle in the first train was a four-wheeled refrigerator meat van, which was completely wrecked, and the brake van next ahead of it and a mail van, which was the third vehicle from the rear, had their ends badly damaged. Fogmen had been sent for at 12.30 a.m., but had not arrived when the collision occurred

the signals were lowered for it and it passed Potteric Carr at 1.44. According to driver A. Southwell, a few patches of fog were encountered after leaving Grantham, but at Black Carr signal-box the fog was denser and he accordingly closed the regulator and reduced speed. He was just able to see the signals at Potteric Carr and at Decoy No. 1, but on passing Red Bank box he could not be certain whether he had seen Balby Junction distant signal or not. He was unable to see Balby Junction home signal and consequently stopped at that signal-box, the lights in which he could see faintly from the footplate, in order to send his fireman to the box for verbal instructions. On ascertaining that the line was clear, and

tion at about its usual clear weather speed, and Creasey sent the running-away signal to Bridge Junction. Creasey was the only signalman to commit an irregularity; he admitted that, as the fogmen were not at their posts, he should not have accepted the 10.32 until he had had train-out-of-section from Bridge Junction. That acceptance, it must be added, was asked for by Red Bank when he knew it was useless to send the running-away signal as the train would already be at Balby Junction. Colonel Woodhouse here drew attention to the unusually short sections at this point.

Signalman Buckett at Bridge Junction did not send train-out-of-section for the 10.25 as he had not had it from South Yorkshire Junction and was working fog-block. His fogman arrived at that moment and was sent to put a detonator on the rail but could not



at 1.52 a.m. The accident was inquired into by Lieut.-Colonel Woodhouse, and our sketch shows the signal-boxes and signals concerned.

On account of the close proximity of the signal-boxes, short-section working is in force between Potteric Carr and South Yorkshire Junction boxes, that is to say, each signalman sends forward the Is-Line-Clear signal as soon as he has accepted a train offered to him from the box in rear. In Potteric Carr, Decoy No. 1, Balby Junction, Bridge Junction and South Yorkshire Junction boxes there are mechanical indicators which show when the signalman in the box ahead has operated the slot controlling his distant signal. The regulations in force lay down that unless this indicator shows "off" the home signal worked from the box in which the indicator is fixed is not to be lowered until an approaching train has nearly reached it, even though the train may have been accepted by the box ahead. This method of working carries out the principles of General Rule 39 (a) and also has the effect that Potteric Carr distant signal is not lowered until the succeeding stop signals, as far as Red Bank starting signal inclusive, are "off"; similarly, Balby Junction distant signal, when lowered, indicates that the succeeding stop signals are "off" as far as Doncaster South, the next box north of South Yorkshire Junction.

There was a clear road for the passage of the 10.25 p.m. train, which had been offered forward in the prescribed manner by the signalmen in the boxes named, at about 1.37 a.m. All

that all signals were "off" for his train, he ran forward slowly and found that the light of the South Yorkshire Junction distant signal was just visible. He estimated that he passed Bridge Junction box at about 15 m.p.h.

Signalman Pickering, at Potteric Carr kept his distant "on" but lowered his home signal and estimated the speed of the train, as it passed his box, as about 50 m.p.h. Signalman Hewerdine at Decoy No. 1 kept his signals at "danger" as the train had not been accepted by Red Bank. When it ignored the signals he sent the train-running-away-on-right-line block signal to Red Bank. He could not place a detonator on the track as shunting was proceeding on an intervening line, but he waved a red light and shouted. Signalman Westney at Red Bank was working "fog-block" because of the absence of the fogmen and so did not accept the 10.32 train as he had not had train-out-of-section from Balby Junction for the 10.25. When he received the running-away signal he went to put a detonator on the rails, but as the train was so close to him he could not do so. He waved a red light, but failed to attract the driver's attention, and the train passed at its usual clear weather speed. On Westney's instructions the telephone boy told Bridge Junction what had happened.

Signalman Creasey of Balby Junction related how the 10.25 stopped at his box and how he had verbally assured the fireman that all the signals were "off." As at the other boxes the signals were restored behind the 10.25. The 10.32 passed those at Balby Junc-

do so with safety as the 10.32 was too close to him. In the fogman's opinion the speed of the train was about 40 m.p.h. Buckett sent the running-away signal to South Yorkshire Junction and then heard the collision, which took place 36 yards in advance of his box.

Driver Hammond, of the 10.32, left Grantham on time and, though fog of varying density was encountered on the way, could see the signals without difficulty until Bawtry, about 8 miles south of Doncaster, was reached. The fog then became thicker, but he could still distinguish the signals, though he had to cross over to the left-hand side of the footplate at times to do so. On reaching Black Carr advanced starting signal he thought he could see Potteric Carr distant, which is below it, showing a green light, but he admitted that he saw one green light only, not two. He said that he failed to see Potteric Carr home signal and Decoy No. 1 distant below it, but that he was able to identify Potteric Carr signal-box from his own, the right-hand, side of the footplate. He was unable to see Decoy No. 1 home signal or the signal-box there, but stated that his fireman, who had been looking out from the left-hand side of the footplate to assist him from Potteric Carr box onwards, turned to him, waved an arm and remarked "all right"; he took this to mean that the fireman had managed to see the signals at Decoy No. 1 and that they were "clear" for him. The same thing happened at Red Bank—Hammond did not see the home signal or the starting signal there, but his fireman again remarked "all-right,"

which he understood to mean that the latter had seen them, and that they were "clear" also. He could not recollect working with the fireman in question previously in a dense fog.

Hammond said that he could just see a light in Balby Junction box as he passed and so realised that he had missed Balby Junction home and Bridge Junction distant signals. He therefore prepared to stop at Bridge Junction home signal but was unable to see it; when he ran under Balby overbridge, he realised that he had overshot that signal too. He stated that he then made a full application of the brake but that the collision took place before he could stop. He had closed the regulator at Red Bank and thought that his speed had been reduced to about 40 m.p.h. at Balby Junction and to about 20 m.p.h. at Balby overbridge. At the time, he thought that his speed when the collision occurred was about 10 m.p.h., but the results, he admitted, made him believe that this was an underestimate. He added that he might have been able to avoid the accident if he had exploded a detonator at any signal concerned.

Hammond said that it was not until February last that he commenced to learn the Doncaster-Grantham road. During that month he had eleven trips over it in both directions in daylight, travelling as third man. In March the Chief Clerk of the York Locomotive Depot inquired if he knew it sufficiently well to be booked to work over it, and he asked for at least one more instructional trip to refresh his memory. This he took on March 19, travelling south by night and back to York by day. He was then confident that he knew the road, and though he did not sign the book to that effect, he stated that he would have done so without hesitation had he been asked. He was booked to run over this section from March 20 to 24 inclusive, working express passenger trains from York to Grantham in the dark and from Grantham to York by day. On Monday and Tuesday, March 26 and 27, he worked a fish train from York to Grantham, returning on March 27 and 28 with the 10.32 p.m. from King's Cross. Hence the night of the accident was the seventh time that he had worked northwards from Grantham to Doncaster in charge of a train and only the second time by night.

Hammond's fireman, Wraith, stated that Hammond and he had been working together for about a month. He agreed that he was looking out for signals from Potteric Carr northwards, but said that he was not well acquainted with the road and that if he had seen a signal he would have had to leave its interpretation to the driver; he had no special agreement with Hammond as to how information regarding signals seen in fog should be communicated. He stated that he was not able to distinguish any signals at all while he was looking out and that when near Decoy No. 1 box he said to

Hammond, "Have you got them all-right?" to which Hammond replied "All-right." Similarly, he said that the remark he made when nearing Red Bank was "Are we all-right." He denied that he waved his hand or made any gesture on either occasion which could have been interpreted to mean that the signals were "clear," and emphasised that even if he had seen a green light he would not have been sure whether it applied to the line on which the train was travelling.

In summing up the evidence, Colonel Woodhouse deals with what the fireman said to his driver, and admits that if the remarks were, as alleged, only partly heard, the concluding words "all right" might well have misled Hammond. Colonel Woodhouse, though, considers that Hammond was taking an unwarrantable risk in proceeding on such an assurance without having previously ascertained that his fireman was competent to give it or asking for more definite information as to the signals he had seen. Moreover, the two signals that the driver thought his fireman had seen are on the driver's own side, on gantries over the line. Finally, Hammond's action in running beyond Balby Junction box, which he said he identified, when he realised that he had not seen the signals there, was quite inexcusable and might be looked upon as the immediate cause of the collision.

The report proceeds to say that if signalman Westney, at Red Bank, had sent forward the running-away signal to Balby Junction as soon as he received it, it was possible that Creasey, at that box, would have had time to place detonators on the line. But Westney was in a difficult position; since he had not had train-out-of-section from Balby Junction for the 10.25 at that time, he took the proper course in endeavouring at once to place detonators on the line himself. His action in causing a telephone message to be sent to the next box but one ahead, as soon as the 10.32 had passed, showed that he was fully alive to the situation.

Colonel Woodhouse concludes his report thus: It is difficult to avoid the conclusion that a contributory cause of this accident was driver Hammond's limited knowledge of the road. Had he been better acquainted with it I doubt whether a man of his experience would have made the initial mistake with regard to the Potteric Carr distant signal, and I also feel certain that he would have realised that if he could not see the signals at Decoy No. 1 box and at Red Bank himself, on account of the fog, it was most improbable that his fireman had done so. Though there was no suggestion that Hammond was directed to work between Doncaster and Grantham before he felt confident of his ability to do so, it appears to me that unnecessary risks are involved if a driver's first run by night over a section of line is made when he is in charge of a fast and important train, as was the case with Hammond on the night pre-

vious to the accident. I therefore consider that the company should be asked to ensure in future that drivers' instructional trips over sections of line new to them are made by night as well as by day, or, alternatively, so to arrange their duties that night running over such sections is first performed while working trains of a less important character. I feel, too, that the formality of signing the route book is not one which should be neglected, as in this case, for even though this may be done without due consideration by some men, the act of signing will, I feel certain, have a definite significance for the conscientious driver, and cause him mentally to review his knowledge before he performs it.

The accident is clearly one that would have been averted had Automatic Train Control apparatus been installed, operating either with the distant or with the home signals. I doubt whether more powerful lights in the existing signals, all of which except Red Bank starting signal are lofty, would have been of much service in the dense fog which prevailed, but colour light signals fixed at about the level of a driver's eye, would in all probability have been visible at short range under such conditions.

None of the signal-boxes concerned was equipped with detonator-placing apparatus. Had this existed at Red Bank the accident would, in all probability, have been prevented; it is possible, too, that such apparatus would have been of service to signalman Hewerdine at Decoy No. 1, who realised, before it reached his box, that the 10.32 train was travelling too fast to stop at his signals. Where boxes are in such close proximity it is important that means should be provided whereby a signalman can place detonators on the rail to stop a train in emergency with the least possible delay, for it is clear that in circumstances such as those under consideration he may have to act at very short notice. I therefore recommend that the company be asked to consider the provision of detonator-placers at these boxes and at others similarly situated. In this connection I may add that in the course of the inquiry I noticed that spare levers were available in the five boxes concerned.

Attention has been drawn to the long delay which occurred after the onset of the fog before fog-signalmen reported for duty, amounting in one case to nearly 2½ hours; this must be regarded as being, to some extent, a contributory cause of the accident. If they had been at their posts when the 10.25 train arrived, it is probable that driver Southwell would not have stopped at Balby Junction, and driver Hammond would have received an audible warning that he was running past signals. At a busy centre such as this it appears that an improvement in this respect should be possible and I recommend that the company be asked to give attention to the matter.

British and Irish Railway Traffic Returns

GREAT BRITAIN	Totals for 33rd Week			Totals to Date		
	1934	1933	Inc. or Dec.	1934	1933	Inc. or Dec.
L.M.S.R. (6,940½ mls.)	£	£	£	£	£	£
Passenger-train traffic...	659,000	636,000	+ 23,000	15,906,000	15,653,000	+ 253,000
Merchandise, &c. ...	427,000	404,000	+ 23,000	14,462,000	13,312,000	+ 1,150,000
Coal and coke ...	217,000	207,000	+ 10,000	7,364,000	7,045,000	+ 319,000
Goods-train traffic ...	644,000	611,000	+ 33,000	21,826,000	20,357,000	+ 1,469,000
Total receipts ...	1,303,000	1,247,000	+ 56,000	37,732,000	36,010,000	+ 1,722,000
L.N.E.R. (6,339 mls.)						
Passenger-train traffic...	429,000	408,000	+ 21,000	10,177,000	10,040,000	+ 137,000
Merchandise, &c. ...	296,000	283,000	+ 13,000	10,062,000	9,201,000	+ 861,000
Coal and coke ...	222,000	199,000	+ 23,000	7,391,000	6,739,000	+ 652,000
Goods-train traffic ...	518,000	482,000	+ 36,000	17,453,000	15,940,000	+ 1,513,000
Total receipts ...	947,000	890,000	+ 57,000	27,630,000	25,980,000	+ 1,650,000
G.W.R. (3,750 mls.)						
Passenger-train traffic...	292,000	288,000	+ 4,000	6,661,000	6,696,000	- 35,000
Merchandise, &c. ...	175,000	164,000	+ 11,000	5,819,000	5,385,000	+ 434,000
Coal and coke ...	100,000	98,000	+ 2,000	3,212,000	3,180,000	+ 32,000
Goods-train traffic ...	275,000	262,000	+ 13,000	9,031,000	8,565,000	+ 466,000
Total receipts ...	567,000	550,000	+ 17,000	15,692,000	15,261,000	+ 431,000
S.R. (2,176 mls.)						
Passenger-train traffic...	397,000	387,000	+ 10,000	9,660,000	9,531,000	+ 129,000
Merchandise, &c. ...	67,000	65,000	+ 2,000	2,062,000	1,968,500	+ 93,500
Coal and coke ...	28,000	29,000	- 1,000	1,011,000	951,500	+ 59,500
Goods-train traffic ...	95,000	94,000	+ 1,000	3,073,000	2,920,000	+ 153,000
Total receipts ...	492,000	481,000	+ 11,000	12,733,000	12,451,000	+ 282,000
Liverpool Overhead ...	1,368	1,379	- 11	37,964	37,355	+ 609
Mersey (4½ mls.) ...	3,559	3,801	- 242	135,167	130,870	+ 4,297
*London Passenger Transport Board ...	498,800	500,900	- 2,100	3,671,500	3,641,100	+ 30,400
IRELAND						
Belfast & C.D. pass. (80 mls.)	3,222	3,656	- 434	84,252	85,974	- 1,722
" " goods	441	435	+ 6	17,046	17,248	- 202
" " total	3,663	4,091	- 428	101,298	103,222	- 1,924
Great Northern pass. (562 mls.)	14,600	14,250	+ 350	323,000	236,700	+ 86,300
" " goods	8,350	7,900	+ 450	269,400	195,800	+ 73,600
" " total	22,950	22,150	+ 800	592,400	432,500	+ 159,900
Great Southern pass. (2,158 mls.)	35,445	35,889	- 444	790,326	772,158	+ 18,168
" " goods	33,070	29,514	+ 3,556	1,046,200	977,211	+ 68,989
" " total	68,515	65,403	+ 3,112	1,836,526	1,749,369	+ 87,157

* 7th week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are however adjusted for comparative purposes

Railway Conciliation Machinery.

—A further conference took place on Monday last between the General Managers of the four main line railway's and representatives of the railwaymen's trade unions in regard to the scheme of conciliation machinery which is to take the place of the Central and National Wages Boards. After the meeting it was announced that the negotiations were advanced a stage and that another meeting would take place shortly after the holidays. At Monday's conference there were present, for the railway companies, Sir James Milne (G.W.R.) in the chair, Sir Ralph Wedgwood (L.N.E.R.), Sir Herbert Walker (S.R.), Mr. G. L. Darbyshire representing Mr. W. V. Wood (L.M.S.R.), and Mr. Kenelm Kerr and Mr. F. Gilbert (Chairman and Secretary respectively of the Railways Staff Conference). For the unions there were Mr. John Marchbank and Mr. J. Henderson (National Union of Railwaymen), Mr. W. J. R. Sqaunce and Mr. G. H. Tyler (Associated Society

of Locomotive Engineers and Firemen), Mr. A. G. Walkden and Mr. F. B. Simpson (Railway Clerks' Association).

Hellenic State Railways' Receipts.

—A report issued by the Department of Overseas Trade on Economic Conditions in Greece records a slight improvement in goods and passenger traffic on the Hellenic State Railways during 1933 as compared with the preceding year. The figures were 2,632,000 passengers and 1,144,512 tons of goods—increases of 314,000 and 135,979 respectively on 1932. The report of the State Railways for 1932-1933, however, showed a working loss, with receipts at 1,000,000 drachmae below those for the preceding financial year. A fairly successful competitor with the railways is the Greek air company, Société Hellénique de Communications Aériennes, which charges passenger and freight rates comparing not unfavourably with those for rail transport.

British and Irish Railway Stocks and Shares

Stocks	Highest 1933	Lowest 1933	Prices	
			Aug. 22, 1934	Rise Fall
G.W.R.				
Cons. Ord.	55½	31	51½*	—
5% Con. Prefce.	109½	69½	112*	—
5% Red. Pref. (1950) ..	109½	87½	109½*	—
4% Deb.	108½	99½	109½	—
4½% Deb.	108	100½	111½	—
4½% Deb.	116	106	118½	—
5% Deb.	128	117½	130	+
2½% Deb.	65	60	69½	—
5% Rt. Charge	124	111½	126½	—
5% Cons. Guar.	122	103	124½*	—
L.M.S.R.				
Ord.	297½	12½	23	—
4% Prefce. (1923)	51	17	47½	-½
4% Prefce.	72	33½	79*	-1
5% Red. Prf. (1955) ...	93	47½	99½*	—
4% Deb.	103½	89½	103	—
5% Red. Deb. (1952) ...	114	105	113½	—
4% Guar.	97½	68½	100*	—
L.N.E.R.				
5% Pref. Ord.	22½	7½	17	+½
Def. Ord.	10½	4½	8½	+¼
4% First Prefce.	65½	19½	62½	-1
4% Second Prefc.	40½	12½	31	—
5% Red. Pref. (1955) ...	83½	27	84	—
4% First Guar.	94½	58½	93½*	-½
4% Second Guar.	89½	48	88*	—
3% Deb.	77	60½	76½	—
4% Deb.	102½	80	101½	—
5% Red. Deb. (1947) ...	112	102½	111½	—
4½% Sinking Fund Red. Deb.	107½	98½	107½	—
SOUTHERN				
Pref. Ord.	71	27½	74	—
Def. Ord.	24½	9½	24	+½
5% Prefce.	107½	74	112*	—
5% Red. Pref. (1964) ...	107½	78½	111½*	—
5% Guar. Prefce.	124½	102½	124½*	—
5% Red. Guar. Pref. (1957) ..	115½	103½	114*	—
4% Deb.	107½	96½	107	+½
5% Deb.	126½	114½	126½	+1
4% Red. Deb. 1962-67 ..	107½	100	108½	—
BELFAST & C.D.				
Ord.	6	4	5	—
FORTH BRIDGE				
4% Deb.	99½	95½	101½	—
4% Guar.	98½	94	102½	—
G. NORTHERN (IRELAND)				
Ord.	7½	3½	5	—
G. SOUTHERN (IRELAND)				
Ord.	28	16	14	—
Prefce.	24	12½	16½	—
Guar.	42	16½	46	—
Deb.	60	30½	63	—
L.P.T.B.				
4½% "A"	117½	112	120	+½
5% "A"	127½	119½	129½	+1
4½% "T.F.A."	111½	106	110	—
5% "B"	122½	114	123	+1
5% "O"	96½	74½	80*	—
MERSEY				
Ord.	16½	5	12	—
4% Perp. Deb.	83	63½	86½	—
3% Perp. Deb.	62	51	64½	—
3% Perp. Prefce.	50½	27	51½	—

* ex-dividend.

NOTES AND NEWS

Air Excursions to the Seaside.—

The first air excursions to the seaside were run on Wednesday of last week by Railway Air Services Limited. They operated from Liverpool to Cowes, Birmingham, and Plymouth, and from Birmingham to Plymouth and Cowes. The ordinary single fares were charged for the double journey.

Seaside Evenings Prove Popular.

—Some 190,000 passengers have been carried by L.N.E.R. evening excursion trains during the last six months. These cheap evening trips were begun as an experiment in February and met with a response so satisfactory that they are now being extended and developed in many districts. These special trains are run in two or three parts when necessary, and the popularity of these trips is shown by the following passenger totals for last week-end:—First trip for 2s. Cambridge to Hunstanton, 1,726; Nottingham to Skegness, 1,955; Batley to Scarborough, 1,100; Wakefield, Worksop and Mexborough to Cleethorpes, 3,886; and Leicester to Skegness, 1,646.

The Week's Road Accidents.—The Secretary to the Ministry of Transport has issued the following return, for the week ended August 11, of persons killed or injured in road accidents:—

	Killed in accidents reported during the week No.	Reported during the week as having died as the result of accidents occurring in previous weeks No.	Injured in accidents reported during the week No.
England	101	33	4,751
Wales ...	16	1	351
Scotland	9	—	493
	126	34	5,595

The total fatalities of the week, as the result of road accidents, were, therefore, 160, as compared with 148 for the previous week. The inclusion in the current figures of part of the Bank Holiday week-end, however, makes exact comparison impossible. We referred on page 287 of last week's issue to the Bank Holiday figures.

Railway and Air Services Co-ordination.—In an article on air and mail progress and problems in the July-August issue of *World Trade*—the journal of the International Chamber of Commerce—the urgent necessity of co-ordination between railway and air services is strongly urged by Mr. Martin Wronsky, Managing Director of the Deutsche Lufthansa A.G., and Chairman of the Sub-Committee on Air Mail of the I.C.C. The writer contends that railway and air time-tables should be arranged in such a way that mail trains connect with air services at intermediate points, so the air mail from places unprovided with aerodromes can there be transferred to the machines.

Moreover, he declared, it was only by the extension of air and rail transport that the countries so far unprovided with air services could be drawn into the international network of air communication.

Flower Show on L.M.S.R. Station Platform.

—A station platform was the unusual venue chosen by the Rugby branch of the L.M.S.R. Horticultural Society for its annual flower show on Wednesday last, August 22. This show, for which about 300 entries were received, took place in the centre of the main station platform at Rugby, the chairman being Mr. D. J. Roberts, the stationmaster. The annual show of the L.M.S.R. Horticultural Society (Southern Division) was held at the London Orphan School Grounds, Watford, on Saturday last, August 18; over 1,500 entries were received for the 117 classes.

The Position Regarding the C.E.R.

—It now appears from an official statement by the Manchukuo Government, that the figures finally used in course of the bargaining for the Chinese Eastern Railway, were roughly £7 millions offered by that Government and £9½ millions demanded by the Soviet Government. So far both sides would seem to be adamant in adhering to these sums as representing the limits beyond which they are not prepared to go. Meanwhile, the Japanese Government repudiates the suggestion that it intends to seize the railway and reiterates the allegation that attacks on the line, kidnapping, &c., are the result of Soviet provocation. It intends to issue a stern warning to the U.S.S.R. on the subject. On the other hand Moscow complains that the position of Soviet employees on the line is being made untenable by the withdrawal of the "train shops" on which they depend for their food supplies.

The Acworth Scholarship.—An Acworth Scholarship, founded in memory of the late Sir William Acworth, will be awarded by the London School of Economics and Political Science (University of London) in September. The scholarship, which is of the value of £60 for the present year, 1934, is tenable for one year, with a possible extension to two years, and is open to students who have passed the Intermediate B.Sc.(Econ.) or the Intermediate B.Com. examinations as internal or external students of the university. The successful scholar must pursue the usual course for the Final B.Sc.(Econ.) or the Final B.Com. as an internal student of the university and a regular day student of the school. He will be required to proceed to the special subject of "Organisation of Transport and of International Trade" for the B.Sc.(Econ.), or to Group B (with the optional subject of Inland Transport) for the B.Com. Degree. In awarding the scholarship, preference will be given to students in the employ-

ment of a company or companies operating railways in Great Britain. Intending candidates should apply to the Secretary of the School for a form of application, which should be completed and returned not later than September 12, 1934.

G.W.R. Railwaymen's Floral Fete.

—What is claimed will be the largest floral fete ever arranged by railwaymen will take place at Oxford tomorrow. The fete will be opened by Sir W. James Thomas, President of the G.W.R. Social and Educational Union, and a Director of the G.W.R.

P.L.M. Posters.—The French Riviera for perpetual Sunshine is the subject of a brightly coloured poster issued by the P.L.M. Railway in connection with the company's new 30-day "holiday" cheap tickets, information concerning which is obtainable at the P.L.M. London office, 179, Piccadilly, or at the Southern Railway Continental Enquiry Office in Victoria station, S.W.1. Two other attractive posters which reach us from the same source relate to Corsica and the Route des Alpes, and were commented upon in our issue for February 9 last, on page 226.

L.M.S.R. Mixed Traffic Locomotives.

—We are advised by the L.M.S.R. of an error whereby the weight of the tenders in the official description of the new 4-6-0 type mixed traffic locomotives which appeared on page 227 of our August 10 issue was given incorrectly. The tenders of these engines weigh 27 tons 5 cwt. light and 54 tons 2 cwt. loaded, and not as originally stated. The weights of the engine and tender combined are 92 tons 15 cwt. light and 126 tons 2 cwt. loaded. This type of tender is shown in the illustration on page 308 of the present issue of the new 4-6-0 three-cylinder locomotive.

New Coal Shipping Hoists at Cardiff, G.W.R.

—The Great Western Railway has just brought into use the second of the two new hoists on the east side of the Roath Basin, Cardiff thus completing the coal shipping equipment programme at Cardiff Docks under the Development (Loans, Guarantees and Grants) Act, 1929, and fully described in the Great Western Railway Developments Special Number of THE RAILWAY GAZETTE of December 8, 1933. The hoist at the southern end of the basin has been erected on the quay side, while the appliance at the northern end has been erected on a jetty 50 ft. from the quay. This arrangement will permit of two large ships to be loaded simultaneously. A mechanical spade or digger is being installed on the new quayside hoist, whilst screening facilities have been provided on the jetty hoist. Both these two new hoists have a lifting capacity of 60 ft. from quay level, and this enables the largest type of vessel to be dealt with not only for coal loading, but also for bunkering. Both hoists are also equipped with escalator-type anti-breakage appliances.

CONTRACTS AND TENDERS

John Baker & Bessemer Limited has received orders from the Peruvian Corporation for 300 solid rolled steel disc wheels for tenders, carriages and wagons, and 50 steel axles for 30-ton cars.

Metropolitan-Vickers Electrical Co. Ltd. has received a part contract from the Southern Railway for the supply of Cosmos electric lamps for 12 months ending August 31, 1935.

Sentinel Wagon Works Limited has received an order from La Guira Harbour Corporation Limited for one standard Sentinel 100-h.p. 0-4-0 steam shunting locomotive with vertical boiler for service on the 3 ft. gauge.

Cowans Sheldon & Co. Ltd. has received an order from the Chinese Government Purchasing Commission for one set of 40-tons capacity locomotive lifting jacks for the Hangchow-Kiangshan Railway to the inspection of Messrs. Fox & Mayo, consulting engineers.

Werkspoor N.V., of Amsterdam, has received an order from the Netherlands Railways for six corridor coaches for international traffic which will have some novel features. They are to be of the all-steel welded type with the side panels taken down close to the rail level to reduce air resistance, and will have provision for electric heating in addition to an improved form of steam heating. These vehicles will be 70 ft. long over headstocks, and are expected to tare 42 tons.

Diesel Locomotives for Ceylon

Two main line diesel-electric locomotives are to be shipped in September from the Tyne for service on the 5 ft. 6 in. gauge section of the Ceylon Government Railways. They have been built by Sir W. G. Armstrong Whitworth & Co., (Engineers) Ltd., and are similar in wheel arrangement and capacity to the 800 b.h.p. mixed traffic locomotive built by the same firm which is now running on the L.N.E.R. The 20-ton 140 b.h.p. diesel-electric shunting locomotive which, as we recorded in our issue of February 16 last was ordered from Sir W. G. Armstrong Whitworth & Co. (Engineers) Ltd. by the Ceylon Government Railways, is also about to be shipped to its destination.

Skoda (India) Limited has secured an order from the Indian Stores Department for 450 broad-gauge carriage and wagon tyres at a cost of Rs. 33,750.

The United Steel Companies (India) Limited has secured an order from the Indian Stores Department for 116 locomotive and tender tyres at a cost of Rs. 13,228.

Kumardhubi Engineering Works Limited has secured orders from the East Indian Railway for a total of 8,410 cast steel axleboxes at prices from Rs. 11-8-0 to Rs. 14-8-0 each.

Shaw, Wallace & Co. Ltd. has received orders from the Indian Stores Department

for 500 broad-gauge 16-ton carriage and wagon axles at a cost of Rs. 68,437, three broad-gauge locomotive crank axles at a cost of Rs. 5,387, and 9,000 tyre-retaining ring bolts at a cost of Rs. 1,031.

Robert Stephenson & Co. Ltd. has received an order from the Bombay, Baroda & Central India Railway for three boilers for 2 ft. 6 in. gauge B class 2-6-4T locomotives.

Burn & Co. Ltd. has secured orders from the Bengal-Nagpur Railway for 1,629 cwt. of forged steel black bolts at a cost of Rs. 27,463, and 958 cwt. of steel hexagon nuts at a cost of Rs. 17,916.

Guest, Keen & Nettlefolds Limited has received orders from the Bengal-Nagpur Railway for 699 cwt. of forged steel black bolts at a cost of Rs. 18,169, and 805 cwt. of steel hexagon nuts at a cost of Rs. 20,760.

Locomotives for South Africa

In our issue for May 25 particulars were given in this column of 20 modified 15 CA class 4-8-2 mixed traffic locomotives and six modified 16 DA class 4-6-2 express passenger locomotives for which the South African Government Railways and Harbours Administration was inviting tenders. These orders have now been placed as follow:—

Robert Stephenson & Co. Ltd.: 20 modified 15 CA 4-8-2 locomotives with double bogie tenders, and having cylinders 24 in. by 28 in., weight in working order of engine, approx., 107½ tons and of tender 67½ tons, standard 3B type boiler, Associated Locomotive Equipment Company's R.C. poppet valve gear, and tender accommodating 6,000 galls. water and 12 tons fuel.

Henschel & Sohn: Six modified 16 DA 4-6-2 express passenger locomotives, having two cylinders 24 in. by 26 in. and the Associated Locomotive Equipment Company's R.C. poppet valve gear.

The value of the British order exceeds £150,000.

The Dominion Steel & Coal Co. Ltd. has received an order from the South African Railways and Harbours Administration for 7,500 tons of steel rails.

The South African Railways and Harbours Administration is calling for tenders, to be presented in Johannesburg by September 24, for the supply of steel locomotive axles (1935 requirements). Further details of this call for tenders can be obtained from the Department of Overseas Trade.

Henschel & Sohn has received an order from the North Western Railway of India for three 2 ft. 6 in. gauge 2-6-2T locomotives, class ZF for the Kalka Simla Railway. These locomotives are to be fitted with the Caprotti poppet valve gear. The invitation to tender for these engines was recorded in this column in our issue for May 18, when the

leading dimensions of the class were given.

The North British Locomotive Co. Ltd. has received an order for nine sets of cylinders for 2-6-4T type locomotives for the East Indian Railway. These cylinders are to be equipped with the Associated Locomotive Equipment Company's O.C. poppet valve gear.

The Royal Hungarian State Iron, Steel & Machine Works has received orders from the East Indian Railway for seven boilers for 0-6-0 type goods locomotives, nine boilers for 2-6-4T locomotives and seven sets of cylinders for 0-6-0 type locomotives.

Caprotti Valve Gear Limited has received an order for the equipping with Caprotti poppet valve gear of the eight YB class metre gauge 4-6-2 locomotives for the Bengal North Western Railway, which, as recorded in this column in our issue for August 10, are to be built by Nasmyth Wilson & Co.

The East Indian Railway invites tenders, receivable at 105, Clive Street, Calcutta, by September 3, for 400 sets of compound fishplates (Tender No. Track/41) and for 550 sets compound fishplates (Tender No. Track/40 of 1934-35).

The Viação Ferrea do Rio Grande do Sul is calling for tenders, to be presented in Porto Alegre by September 13, for the supply of eleven superstructures for railway bridges. Firms desirous of offering steelwork of U.K. manufacture can obtain details from the Department of Overseas Trade.

The Argentine State Railways Administration is calling for tenders, to be presented in Buenos Aires by October 1, for the supply of two electrically operated turntables with a diameter of 25 metres for 1,435 mm. gauge, and suitable for loading up to 150 tons maximum. Firms desirous of offering turntables of United Kingdom manufacture can obtain further details from the Department of Overseas Trade.

The Chief Controller of Stores, Indian Stores Department (Engineering Section), Simla, invites tenders receivable on the dates named as follow:—

Receivable September 3 for 2,034 steel boiler and superheater tubes for the Jodhpur Railway.

Receivable September 5 for copper tubeplates for F, FO, modified O, M, MS, P and SP class locomotives, Jodhpur Railway.

Receivable September 11 for an engine hoist for lifting M.G. engines and tenders on to B.G. well trucks for the Eastern Bengal Railway.

Receivable September 17 for approximately 4,700 cwt. of bolts, nuts and rivets for the period January 1, to May 15, 1935, for the G.I.P. Railway.

Forthcoming Egyptian Calls for Tenders

The Egyptian Council of Ministers has finally approved the money necessary for the purchase of 20 new standard-gauge locomotives during this year, and tenders will, in all probability, be invited in the next few weeks. Although the type of locomotive required is not finally decided upon, it is believed that a mixed traffic class for service on the lighter portions of the system is most required. An additional grant to that already provided in

the normal railway budget has been given for the purchase of new wagon stock this year, including 10-ton all-steel covered goods wagons, 10-ton perishable vans with vacuum brake for fast goods train working, and cattle wagons. Tenders for plant of 500 kW capacity for an extension to the Egyptian State Railways' electric power station at Abu-Zaabal locomotive works will shortly be invited. The tenders will call for alternative steam or diesel-driven installations and include prime mover, alternator, and building work.

The Egyptian State Railways Administration is calling for tenders receivable on the dates where named as follow:—

Receivable at the General Management, Cairo:—

50 sets steam motor-electric locomotive head lamp equipments (August 30).

370 metric tons steel fishplates (September 12).

One electrically operated goods lift (September 15).

Five railway bridge superstructures comprising approx. 160 tons rolled steel and 12 tons cast steel (September 25).

780 metric tons saddles for rails (September 26).

Supply of machine tools (October 11).

Repairs to and strengthening of seven metal bridge superstructures by electric arc welding (October 6).

400 carriage and wagon tyres (October 11).

Receivable at Office of Superintendent of Stores, Saptieh, Cairo:—

40,000 gallon water tank with supporting pillars, bearing girders, bracings, foundation plates and all necessary fittings (September 3).

2,050 helical springs for short and long type buffers (September 22).

Three petrol-driven inspection railcars (September 29).

30,000 kilos. light lubricating oil (October 2).

Receivable at Chief Inspecting Engineer's Office, 41, Tothill Street, London, S.W.1.

4,680 kg. hexagon brass bars (September 3).

41,500 kg. mild steel round.

200 cast steel axle boxes with front and back covers (September 4).

45,000 tinned sheets.

One year's requirements steel metal screws.

818 ft. steel various dimensions.

One electric crane block to lift 5 tons.

Three sets superheater elements, 24 elements per set, complete (September 5).

Tubes and pipes (September 10).

Two sets superheater elements complete.

100 sets buffers for buffer stops.

Owing to the growth of the machine-tool business handled by Craven Bros. (Manchester) Ltd., that firm has decided to devote its entire organisation and equipment to this end and in consequence the manufacture of Buckton testing machines, carried on for the past six years by Cravens, has now been transferred to W. & T. Avery Limited, which firm will produce Buckton machines in addition to the Avery range and deal with re-calibration, testing and certification of Buckton machines as required. The manufactures of W. & T. Avery Limited, as is well known, range from balances sufficiently sensitive to record differences in weight as a match is consumed to weighbridges to accommodate heavy locomotives. The works at Birmingham incorporate the Soho Foundry in which Watt, Boulton and Murdoch found practical expression for their genius. Machine tools of that period are still preserved, while the present plant can produce with accuracy, economy and expedition a range of precision instruments second to none.

First Railway Air Services Mail and Passenger Service

Inauguration of the London-Birmingham-Manchester-Belfast-Glasgow Service on August 20

On Monday last, August 20, the first Railway Air Services Limited week-daily mail, passenger and freight service was inaugurated between London and Glasgow with intermediate stops at Birmingham, Manchester, and Belfast, and with a connecting service to the Isle of Man—for freight and mails only—from Manchester to Douglas and on to Belfast. It is being operated by R.A.S. Limited on behalf of the L.M.S. Railway and is the first service to link England, Ireland, and Scotland and the first inter-city, inter-country air mail service in the British Isles. The planes carry the Air Mail pennant, and the times for the journey and fares from London are:—

To	Time	Fares	
		Single	Return
Birmingham ..	55 min.	35s.	55s.
Manchester ..	1 hr. 25 min.	60s.	90s.
Belfast ..	3 hr. 10 min.	110s.	185s.
Glasgow ..	4 hr. 20 min.	120s.	200s.

Each passenger is allowed 35 lb. of personal baggage free. Children under seven years of age and over three, are charged half fare but with no baggage allowance.

Personnel and Equipment of the Machines

The New De Havilland four-engined liners used on the service have a cruising speed of 145 m.p.h. and are the fastest four-engined commercial planes in the world. Accommodation is provided for 10 passengers in addition to mails and freight. Four-engined aeroplanes have been chosen for the service in order to provide an adequate margin of safety while crossing the Irish Channel. The machines are capable of continuing a journey with any two of the four engines working.

These express air-liners are manned by a pilot and first officer and are equipped with the most up-to-date type of wireless apparatus, including the "homing" system whereby pilots can, by arrangement with Croydon or Manchester, fly in bad weather without risk of losing their way. There are also wireless facilities at Belfast and Glasgow.

Special road services connect the respective aerodromes with convenient points in the cities served. Passengers holding return air tickets may, if they so desire, return by train while those holding return rail tickets may return by air on payment of a supplementary fare.

Mails for Douglas, I.O.M., and Belfast carried by this service may be posted later in London for first delivery next day than if sent by land and sea. Letters for these places and Glasgow will be delivered there the same day, if not by ordinary delivery, then by express delivery if this is prepaid. The postage rates are 1½d.

for the first two ounces and a penny for each additional ounce, the charge up to two ounces being as by ordinary inland mail.

The Official Inauguration

At Renfrew airport, Glasgow, Sir Harold Hartley, Chairman of Railway Air Services Limited and Vice-President, L.M.S.R., was formally handed the air mail pennant by the Post Office and two planes set off in bad weather on the first stage of the journey southwards, Wing Commander A. H. Measures, Superintendent, R.A.S., and Mr. W. P. Bradbury, General Assistant to the Chief Commercial Manager, L.M.S.R., also being passengers.

Meanwhile, to celebrate the inauguration of the service at the London terminal, a distinguished gathering took place at Croydon airport. Among those present were:—

Brig.-Gen. Sir Frederick Williamson, Director of Postal Services; Mr. P. W. MacIntyre, Deputy Director; Mr. F. G. Green, Assistant Controller, London Postal Service; Group-Capt. Primrose, Adviser to the P.O. on Air Services; Capt. Harris, R.N.R., Chief Marine Supt., L.M.S.R.; Mr. W. A. Stanier, Chief Mechanical Engineer, L.M.S.R.; Mr. J. B. Elliott, Assistant Traffic Manager, Southern Railway; Messrs. G. H. Loftus Allen and W. Brudenell, L.M.S.R. Advertising and Publicity Officer and his Assistant; and Mr. G. E. Orton, Commercial Assistant to the Supt. of the Line, G.W.R.

Unfortunately the southbound planes experienced extremely bad weather on the Belfast-Manchester section of the journey, an 80 m.p.h. wind being encountered and, on arrival at Manchester, an Air Ministry gale warning precluded further flight and the mails were sent on by train. The party at Croydon could not, therefore, welcome the arrival of these planes, but was able to give a send-off to the London-Glasgow plane—an emergency machine brought into service in place of the return of those from Glasgow—complete with mails but with no passengers.

A simple ceremony preceded the departure. Sir Frederick Williamson, with a few suitable words, handed over the first mail bag to Capt. Harris, representing the L.M.S.R., who in turn received it and replied briefly. Sir Frederick then handed a second bag to the pilot of the machine. Post Office officials loaded the remaining bags and the machine took off successfully in spite of the gale, but had to curtail its flight at Birmingham, whence the mails were sent northwards by train.

LEIPZIG FAIR CONCESSIONS.—The Leipzig Fair authorities announce that visitors to the autumn fair, which opens on August 26, will be granted a reduction of 60 per cent. in fares on the German State Railway. This concession will remain valid up to September 8.

Railway Share Market

Movements in the stock and share markets have been less general and business in home railway stocks is probably at the lowest level of the year. This is in striking contrast to the early part of August. The explanation for the relapse in business is to be found in the absence of new developments to stimulate buying operations in the Home Railway market.

The settlement of the wages problem, the progress made with the negotiations regarding machinery for settling similar disputes and the issue of the interim reports of the companies were factors which had previously dominated the market. With their removal the basis for speculative buying on a large scale has also gone. Home railway stocks will now come back to the normal conditions in which prices are influenced by traffic receipts and the development of railway

operations, as distinct from the uncertainties of administrative matters. There has been no disposition to sell stock. Current quotations are well above the lower quotations of the first few weeks of the year, although they are disappointing to many holders who failed to take the long view of the outlook when buying stock last March at prices which now look relatively high. Stock Exchange jobbers, who ordinarily would bid for any stock which is pressed for sale at attractive prices, have taken advantage of the lull in business to absent themselves on holiday. The underlying strength of the market position is to be seen in the appreciation in prices of prior charge stocks. G.W.R. 5 per cent. debenture stock rose two points on Tuesday to 128-132. This is the highest price reached by this stock since it was first sold on the market in 1924. Although the price was raised, it was not due to stock changing hands.

There has been no stock offered on the market since 130 was paid for it on August 16. Much the same scarcity of stock applies to L.N.E.R. 5 per cent. debenture stock. The yield of the former stock is a few shillings per cent. higher than the G.W.R. 4 per cent. debenture stock, of which there is a line on offer in the market at 110. In the case of the L.N.E.R. the yield on the 5 per cent. stock is about 10s. per cent. higher than is yielded by a line of the 4 per cent. stock which is on offer.

It is a sign of confidence in the companies' "recovery" position as well as in cheap money rates of the future that Stock Exchange jobbers are raising the official list prices of the two 5 per cent. stocks named to a high record level. In foreign railway stocks the principal movement has been in Argentine railway issues on the higher prices of grain and the receipt of news of a general rainfall.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1933-34	Week Ending	Traffic for Week		No. of Week	Aggregate Traffic to Date			Shares or Stock	Prices						
			Total this year	Inc. or Dec. compared with 1933		Totals		Increase or Decrease		Highest 1933	Lowest 1933	Aug. 22, 1934	Yield (See Notes)			
						This Year	Last Year									
South & Central America.			£	£		£	£	£								
	Antofagasta (Chili) & Bolivia	830	19 8.34	15,250	+	4,010	33	450,300	337,550	+	112,750	Ord. Stk.	26	113½	24	NU
	Argentine North Eastern ..	753	18 8.34	7,420	—	2,951	7	54,382	74,377	—	19,985	"	141½	5	8	NU
	Argentine Transandine ..	111	—	—	—	—	—	—	—	—	—	A. Deb.	55	40	50	8
	Bolivar	170	July, 1934	5,100	—	150	30	43,850	47,250	—	3,400	6 p.c. Db.	10	5	10	NU
	Brazil	—	—	—	—	—	—	—	—	—	—	Bonds.	15	11	121½	4
	Buenos Ayres & Pacific ..	2,806	18 8.34	68,884	—	234	7	492,615	592,187	—	99,572	Ord. Stk.	26	97½	121½	NU
	Buenos Ayres Central ..	190	24 6.34	10,362	—	79	52	486,263	479,338	+	6,925	Mt. Db.	30	10	21	NU
	Buenos Ayres Gt. Southern	5,085	18 8.34	118,739	—	26,694	7	871,162	1,134,138	—	262,974	Ord. Stk.	44½	21½	29½	NU
	Buenos Ayres Western ..	1,926	18 8.34	46,270	—	2,492	7	314,515	386,131	—	71,616	"	34½	155½	24	NU
	Central Argentine	3,700	18 8.34	128,473	+	7,947	7	916,754	1,018,417	—	101,683	"	28½	15	19	NU
	Do.	—	—	—	—	—	—	—	—	—	—	Dtd.	18	10	9	NU
	Cent. Uruguay of M. Video	273	18 8.34	12,530	—	1,127	7	96,337	99,346	—	3,009	Ord. Stk.	20	8	101½	NU
	Do. Eastern Extn. ..	311	18 8.34	2,376	+	246	7	19,760	17,581	—	2,179	"	—	—	—	—
	Do. Northern Extn. ..	185	18 8.34	1,614	—	138	7	11,563	11,622	—	59	"	—	—	—	—
	Do. Western Extn. ..	211	18 8.34	1,109	—	108	7	7,812	8,622	—	810	"	—	—	—	—
	Cordoba Central	1,218	18 8.34	31,810	—	8,050	7	247,590	301,040	—	53,450	Ord. Inc.	91½	21½	41½	NU
	Costa Rica	188	30 6.34	20,297	—	7,045	52	218,120	240,673	—	22,553	Stk.	29	20	27½	74
	Dorada	70	July 1934	9,000	—	—	30	69,200	53,100	+	16,100	1 Mt. Db.	76½	68½	105	51½
	Entre Rios	810	18 8.34	10,399	—	3,169	7	73,404	98,040	—	24,636	Ord. Stk.	26½	9	14	NU
	Great Western of Brazil ..	1,082	18 8.34	5,800	—	2,300	33	249,500	321,600	—	72,100	Ord. Sh.	23½	12	5	NU
	International of Cl. Amer.	794	June, 1934	\$253,322	—	\$123,148	26	\$2,719,995	\$2,658,881	+	\$61,114	"	—	—	—	—
	Interoceanic of Mexico ..	—	—	—	—	—	—	—	—	—	—	1st Pref.	12	1½	1½	—
La Guaira & Caracas ..	223½	July, 1934	4,455	+	1,455	30	25,890	39,270	—	13,380	Stk.	16	10	8½	—	
Leopoldina	1,918	18 8.34	39,960	+	10,461	33	796,650	779,992	+	16,658	Ord. Stk.	20½	10	10	NU	
Mexican	483	14 8.34	\$211,700	+	\$27,700	6	\$1,409,000	\$1,178,400	+	\$230,600	"	3	12	21½	—	
Midland of Uruguay ..	319	July, 1934	9,461	+	716	4	9,461	8,745	+	716	Ord. Stk.	2	1	1½	NU	
Nitrate	401	15 8.34	10,480	+	6,242	32	165,856	69,848	+	96,008	Ord. Sh.	78½	11½	27½	NU	
Paraguay Central	274	18 8.34	4,400	—	250	7	31,820	29,120	+	2,700	Pr. Li. Stk.	72	49½	70	6½	
Peruvian Corporation ..	1,059	July, 1934	52,617	+	1,372	4	52,617	51,245	+	1,372	Pref.	151½	5	11	NU	
Salvador	100	4 8.34	69,221	—	4,259	5	\$52,041	\$72,905	—	\$20,864	Pr. Li. Db.	70	66½	70	7½	
San Paulo	153½	12 8.34	27,706	—	2,244	32	974,971	958,029	—	16,942	Ord. Stk.	102	68	80	5½	
Taitai	164	July, 1934	7,040	—	3,720	4	7,040	3,320	+	3,720	Ord. Sh.	15½	3½	15½	51½	
United of Havana	1,365	18 8.34	16,803	—	5,066	7	122,244	87,192	+	35,052	Ord. Stk.	8	2	3	NU	
Uruguay Northern	73	July, 1934	1,056	—	10	4	1,056	1,066	—	10	Deb. Stk.	6	3½	4½	NU	
Canada.	Canadian National ..	23,748	14 8.34	566,010	+	15,490	32	19,841,137	17,274,529	+	2,566,608	"	—	—	—	—
	Canadian Northern ..	—	—	—	—	—	—	—	—	—	—	Perp. Dbs.	60½	38	68	5½
	Grand Trunk	—	—	—	—	—	—	—	—	—	—	4 p.c. Gar.	99½	85	101½	31½
India.	Canadian Pacific ..	17,018	14 8.34	453,000	+	21,600	32	14,515,600	13,622,400	+	1,493,200	Ord. Stk.	22½	11	14	NU
	Assam Bengal	1,277	21 7.34	25,537	+	3,351	16	433,842	352,324	+	81,518	Ord. Sh.	79	70	79	31½
	Barsi Light	202	28 7.34	6,630	+	4,800	17	57,180	57,090	+	90	Ord. Stk.	101½	70	100½	6
Various.	Bengal & North Western ..	2,112	28 7.34	41,056	—	2,385	17	899,133	863,307	+	35,826	Ord. Stk.	292	240	279½	5½
	Bengal Doon & Extension ..	161	28 7.34	3,052	—	389	17	43,611	44,735	—	1,124	"	127	119	125	5½
	Bengal-Nagpur	3,269	21 7.34	103,500	+	21,084	16	1,878,285	1,669,543	+	208,742	"	97½	83½	102½	31½
	Bombay, Baroda & Cl. India	3,072	11 8.34	117,150	+	7,050	19	2,973,000	2,832,000	+	141,000	"	112	107	108½	5½
	Madras & South'n Mahratta	3,230	21 7.34	110,175	+	5,454	16	1,889,082	1,918,604	—	29,522	"	127	114½	127½	7½
	Rohilkund & Kumaon ..	546	28 7.34	6,935	—	285	17	173,217	168,306	+	4,911	"	260	225	250½	61½
	South India	2,526	21 7.34	78,722	+	6,115	16	1,333,740	1,279,572	+	54,168	"	119½	112	115½	61½
	Beira-Umtali	204	June, 1934	57,097	+	13,325	38	456,945	366,500	+	90,445	"	—	—	—	—
	Bilbao River & Cantabrian	15	July, 1934	2,522	—	180	30	12,982	10,405	+	2,577	"	—	—	—	—
	Egyptian Delta	621	31 7.34	6,323	+	900	17	65,178	61,780	+	3,398	Pr. Sh.	151½	13½	17½	5½
Various.	Great Southern of Spain ..	104	11 8.34	2,351	—	210	32	65,926	63,461	+	2,465	Inc. Deb.	4	3	3½	—
	Kenya & Uganda	1,625	Mar., 1934	240,520	+	21,064	12	638,137	606,192	+	31,945	"	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	—	B. Deb.	53	33½	36	9½	
	Mashonaland	913	June, 1934	109,112	+	35,582	38	840,132	576,205	+	263,927	1 Mg. Db.	913½	42	94	51½
	Midland of W. Australia ..	277	June, 1934	12,031	—	599	52	158,207	156,705	+	1,502	Inc. Deb.	89	70	97½	4½
	Nigerian	1,905	7 7.34	19,306	—	3,288	14	355,578	323,195	+	32,383	"	—	—	—	—
	Rhodesia	1,538	June, 1934	183,846	+	45,460	38	1,420,241	1,054,190	+	366,051	4 p.c. Db.	98½	80½	102	31½
	South African	13,180	28 7.34	482,470	+	43,317	17	8,248,769	7,292,400	+	956,369	"	—	—	—	—
	Victorian	6,172	May, 1934	755,392	+	15,381	48	8,479,194	8,811,604	—	332,410	"	—	—	—	—
	Zafra & Huélsa	112	June, 1934	10,078	—	121	26	65,801	62,326	+	3,475	"	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1%.

† Receipts are calculated @ 1s. 6d. to the rupee. ‡ ex dividend.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the sterling weekly receipts at the par rate of exchange as proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value.

Yield % (See Note)

of exchange